

# RQJ0603LGDQA

Silicon P Channel MOS FET  
Power Switching

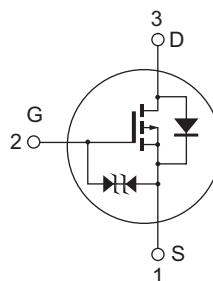
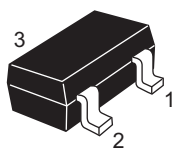
R07DS0300EJ0600  
Rev.6.00  
Jan 10, 2014

## Features

- Low on-resistance  
 $R_{DS(on)} = 158 \text{ m}\Omega$  typ ( $V_{GS} = -10 \text{ V}$ ,  $I_D = -0.9 \text{ A}$ )
- Low drive current
- High speed switching
- 4.5 V gate drive

## Outline

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



1. Source
2. Gate
3. Drain

Note: Marking is "LG".

## 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	$V_{GSS}$	+10 / -20	V
Drain current	$I_D$	-1.8	A
Drain peak current	$I_{D(Pulse)}$ <sup>Note1</sup>	-4.5	A
Body - drain diode reverse drain current	$I_{DR}$	-1.8	A
Channel dissipation	$P_{ch}$ <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:  $40 \times 40 \times 1 \text{ mm}$ )

## Electrical Characteristics

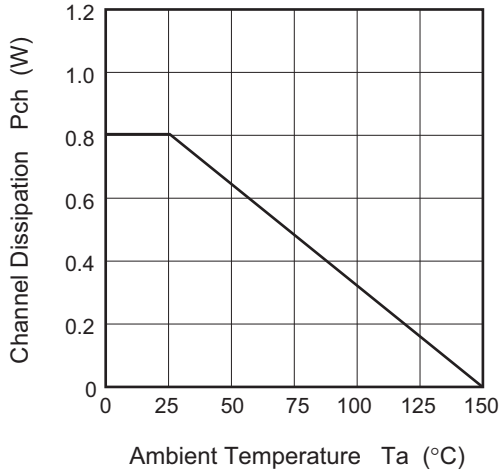
(Ta = 25°C)

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	$V_{(BR)GSS}$	+10	—	—	V	$I_G = +100 \text{ } \mu\text{A}$ , $V_{DS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	-20	—	—	V	$I_G = -100 \text{ } \mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	+10	$\mu\text{A}$	$V_{GS} = +8 \text{ V}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	-10	$\mu\text{A}$	$V_{GS} = -16 \text{ V}$ , $V_{DS} = 0$
Drain to source leak current	$I_{DSS}$	—	—	-1	$\mu\text{A}$	$V_{DS} = -60 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.0	V	$V_{DS} = -10 \text{ V}$ , $I_D = -1 \text{ mA}$
Drain to source on state resistance	$R_{DS(on)}$	—	158	198	$\text{m}\Omega$	$I_D = -0.9 \text{ A}$ , $V_{GS} = -10 \text{ V}$ <sup>Note3</sup>
	$R_{DS(on)}$	—	196	275	$\text{m}\Omega$	$I_D = -0.9 \text{ A}$ , $V_{GS} = -4.5 \text{ V}$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	1.6	2.7	—	S	$I_D = -0.9 \text{ A}$ , $V_{DS} = -10 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	440	—	pF	$V_{DS} = -10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	59	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	28	—	pF	
Turn - on delay time	$t_{d(on)}$	—	22	—	ns	$I_D = -0.5 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_L = 20 \text{ } \Omega$ , $R_g = 4.7 \text{ } \Omega$
Rise time	$t_r$	—	26	—	ns	
Turn - off delay time	$t_{d(off)}$	—	38	—	ns	
Fall time	$t_f$	—	3.2	—	ns	
Total gate charge	$Q_g$	—	7.4	—	nC	$V_{DD} = -10 \text{ V}$ , $V_{GS} = -10 \text{ V}$ , $I_D = -1.8 \text{ A}$
Gate to source charge	$Q_{gs}$	—	1.0	—	nC	
Gate to drain charge	$Q_{gd}$	—	1.1	—	nC	
Body - drain diode forward voltage	$V_{DF}$	—	-0.8	—	V	$I_F = -1.5 \text{ A}$ , $V_{GS} = 0$ <sup>Note3</sup>

Notes: 3. Pulse test

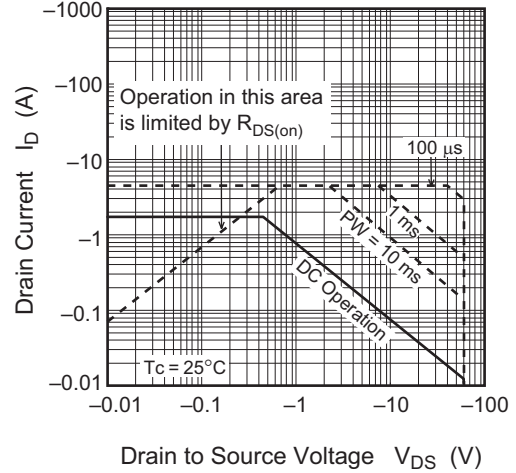
### Main Characteristics

Maximum Channel Power Dissipation Curve

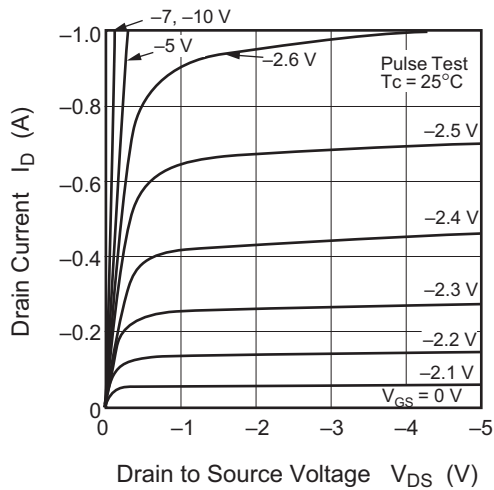


\*When using the glass epoxy board (FR-4: 40 × 40 × 1 mm)

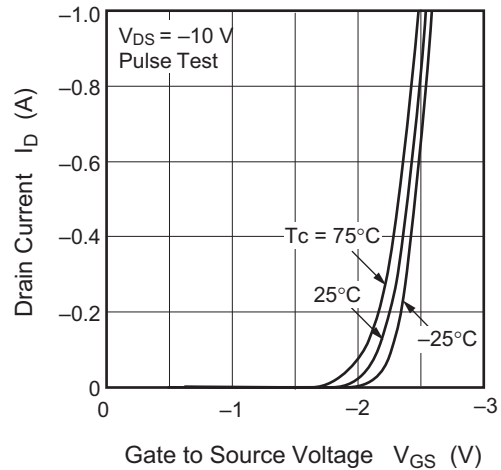
Maximum Safe Operation Area



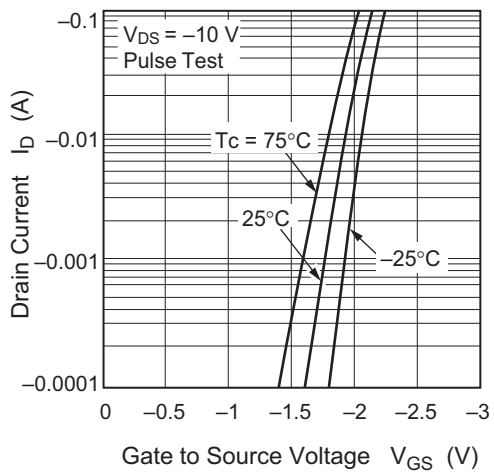
Typical Output Characteristics



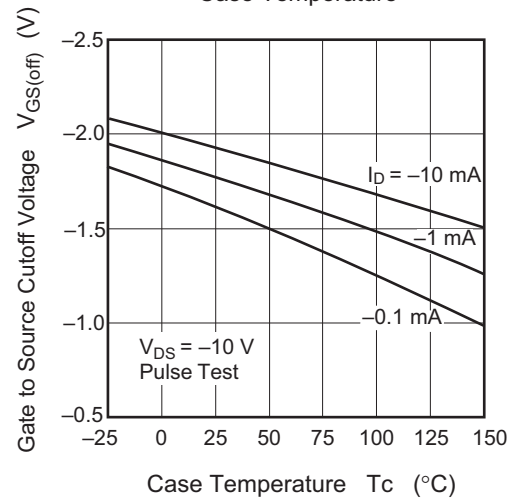
Typical Transfer Characteristics (1)

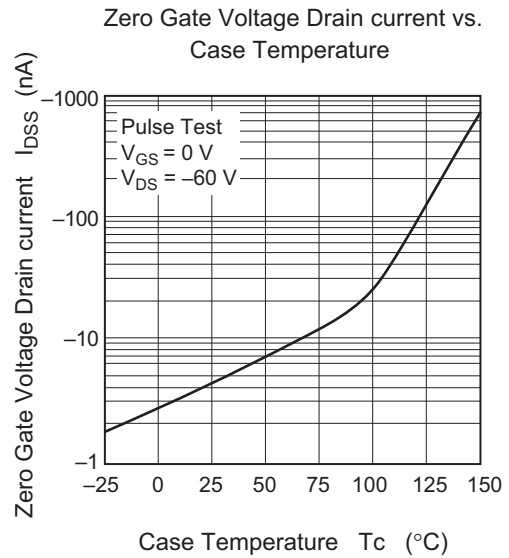
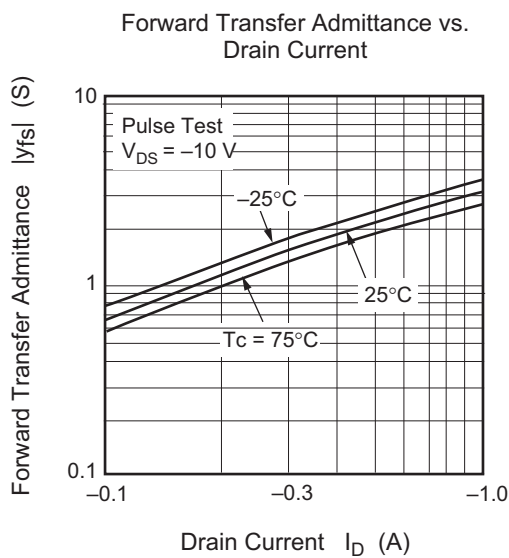
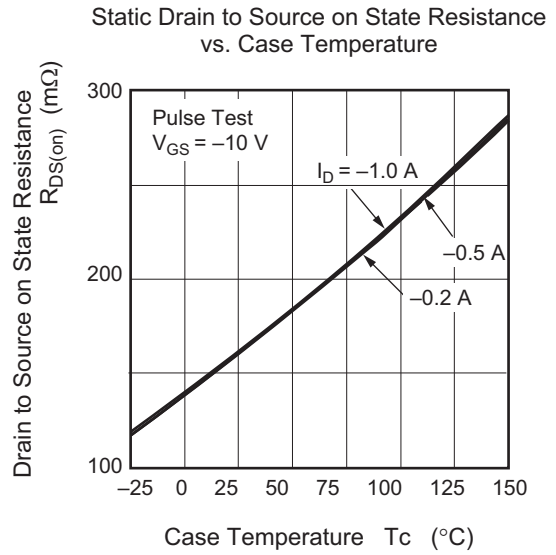
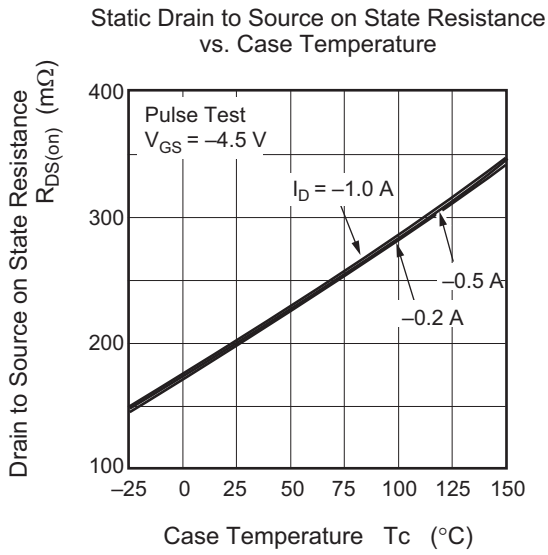
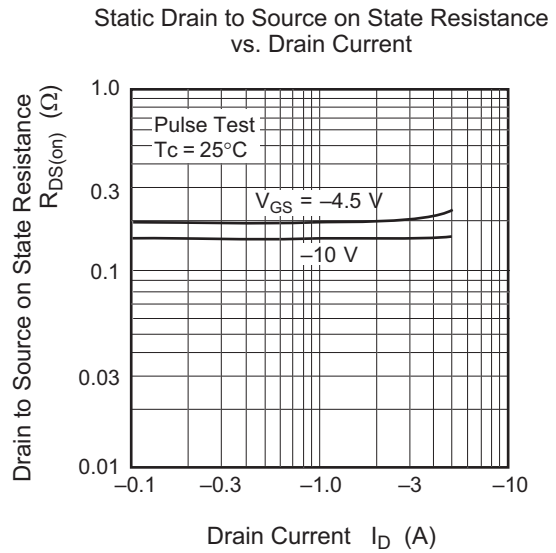
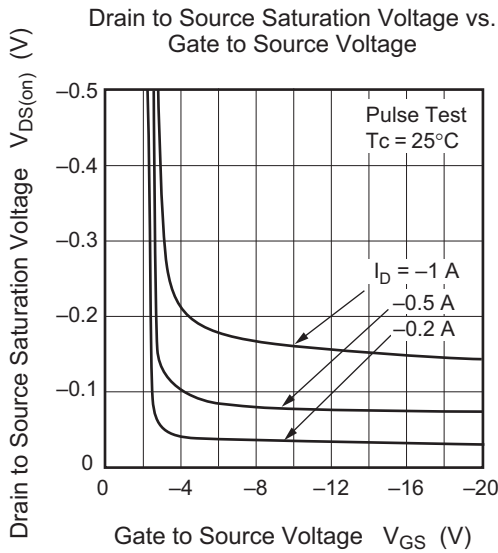


Typical Transfer Characteristics (2)

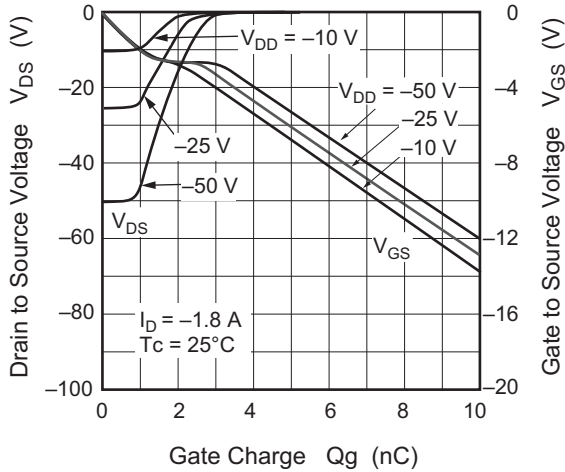


Gate to Source Cutoff Voltage vs. Case Temperature

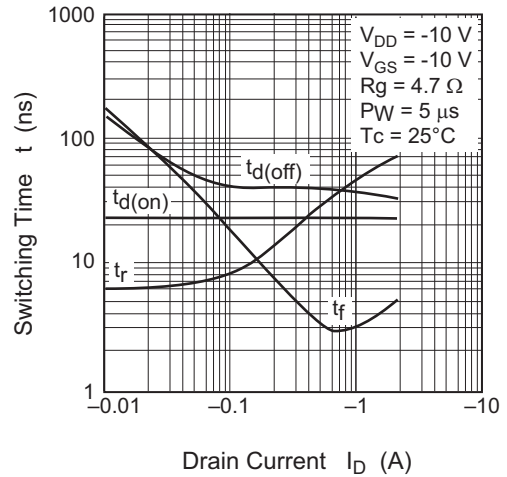




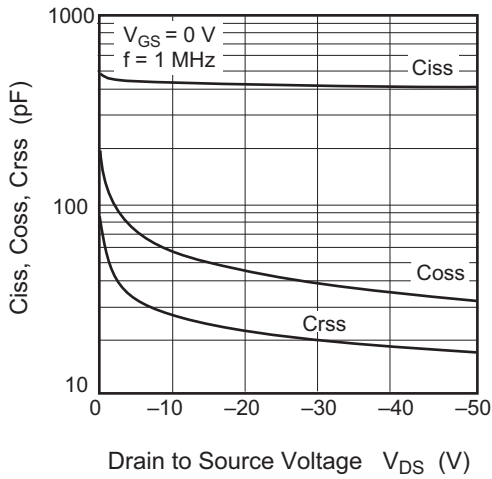
Dynamic Input Characteristics



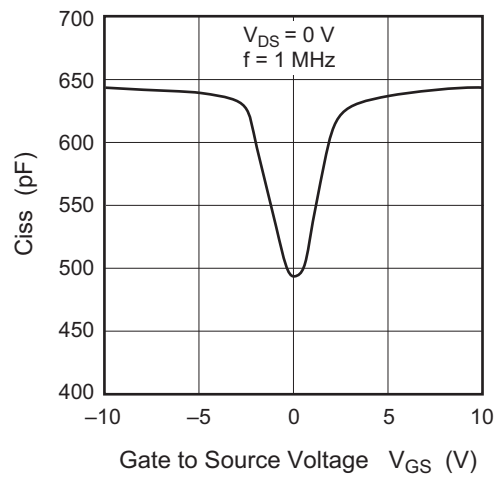
Switching Characteristics



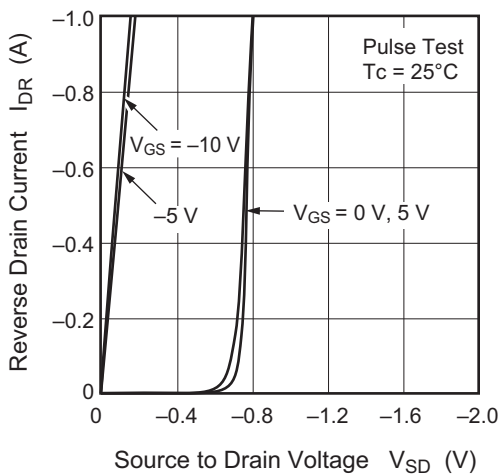
Typical Capacitance vs. Drain to Source Voltage



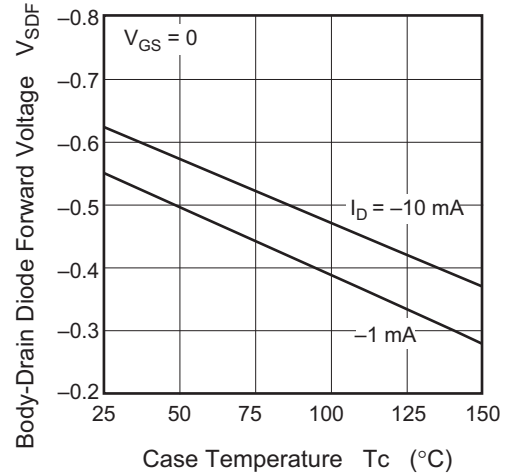
Input Capacitance vs. Gate to Source Voltage



Reverse Drain Current vs. Source to Drain Voltage

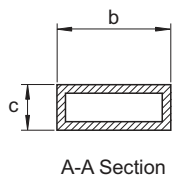
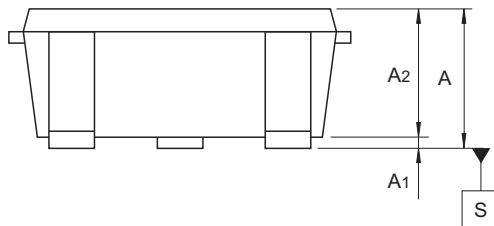
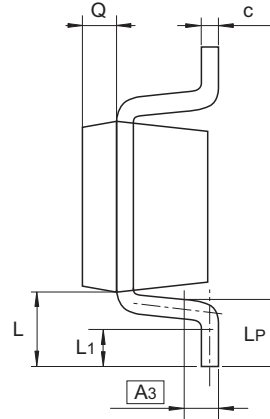
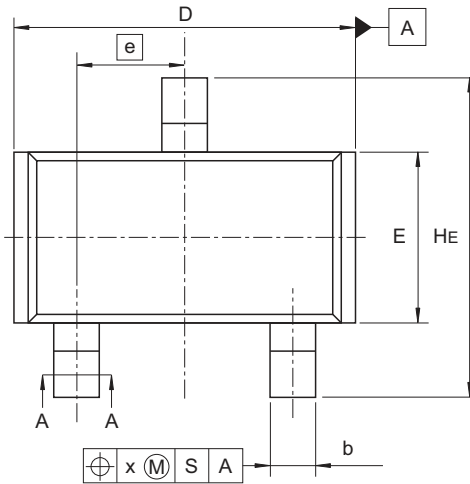


Body-Drain Diode Forward Voltage vs. Case Temperature



Package Dimensions

JEITA Package Code	RENESAS Code	Previous Code	MASS (Typ) [g]
SC-59A	PLSP0003ZB-A	MPAK(T) / MPAK(T)V	0.011



Reference Symbol	Dimensions in millimeters		
	Min	Nom	Max
A	1.0	—	1.3
A <sub>1</sub>	0	—	0.1
A <sub>2</sub>	1.0	1.1	1.2
A <sub>3</sub>	—	0.25	—
b	0.35	0.4	0.5
c	0.1	0.16	0.26
D	2.7	—	3.1
E	1.35	1.5	1.65
e	—	0.95	—
HE	2.2	2.8	3.0
L	0.35	—	0.75
L <sub>1</sub>	0.15	—	0.55
L <sub>P</sub>	0.25	—	0.65
x	—	—	0.05
Q	—	0.3	—

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### Ordering Information

Orderable Part Number	Quantity	Shipping Container
RQJ0603LGDQATL-H	3000 pcs.	φ178 mm reel, 8 mm Emboss taping

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