

RQJ0305EQDQS

Silicon P Channel MOS FET
Power Switching

REJ03G1779-0100

Rev.1.00

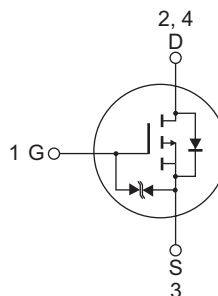
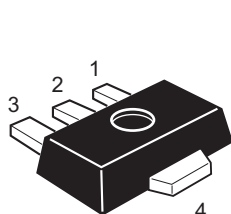
Mar 16, 2009

Features

- Low gate drive
 $V_{DSS} : -30 \text{ V}$ 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 "EQ".

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	-3.4	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	-12	A
Body - drain diode reverse drain current	I_{DR}	3.4	A
Channel dissipation	P_{ch} ^{Note2}	1.5	W
Thermal resistance	$R_{th(ch-a)}$ ^{Note2}	83	$^\circ\text{C / W}$
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 $40 \times 40 \times 1 \text{ mm}$)

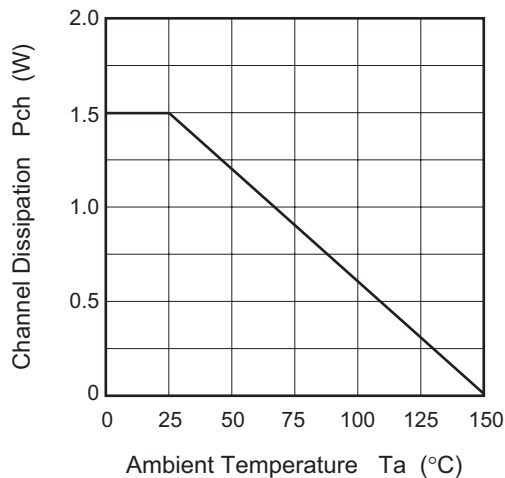
Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-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	μA	$V_{GS} = +6 \text{ V}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	-10	μA	$V_{GS} = -10 \text{ V}$, $V_{DS} = 0$
Drain to source leak current	I_{DSS}	—	—	-1	μA	$V_{DS} = -30 \text{ V}$, $V_{GS} = 0$
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	$R_{DS(on)}$	—	110	140	$\text{m}\Omega$	$I_D = -1.7 \text{ A}$, $V_{GS} = -4.5 \text{ V}$ ^{Note3}
Drain to source on state resistance	$R_{DS(on)}$	—	165	230	$\text{m}\Omega$	$I_D = -1.7 \text{ A}$, $V_{GS} = -2.5 \text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	3.0	4.3	—	S	$I_D = -1.7 \text{ A}$, $V_{DS} = -10 \text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	330	—	pF	$V_{DS} = -10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	70	—	pF	
Reverse transfer capacitance	C_{rss}	—	40	—	pF	
Turn - on delay time	$t_{d(on)}$	—	17	—	ns	$I_D = -1.3 \text{ A}$ $V_{GS} = -4.5 \text{ V}$ $R_L = 7.7 \text{ }\Omega$ $R_g = 4.7 \text{ }\Omega$
Rise time	t_r	—	37	—	ns	
Turn - off delay time	$t_{d(off)}$	—	39	—	ns	
Fall time	t_f	—	10	—	ns	
Total gate charge	Q_g	—	3.0	—	nC	$V_{DD} = -10 \text{ V}$
Gate to Source charge	Q_{gs}	—	0.6	—	nC	$V_{GS} = -4.5 \text{ V}$
Gate to drain charge	Q_{gd}	—	1.3	—	nC	$I_D = -2.4 \text{ A}$
Body - drain diode forward voltage	V_{DF}	—	-0.9	-1.3	V	$I_F = -3.4 \text{ A}$, $V_{GS} = 0$ ^{Note3}

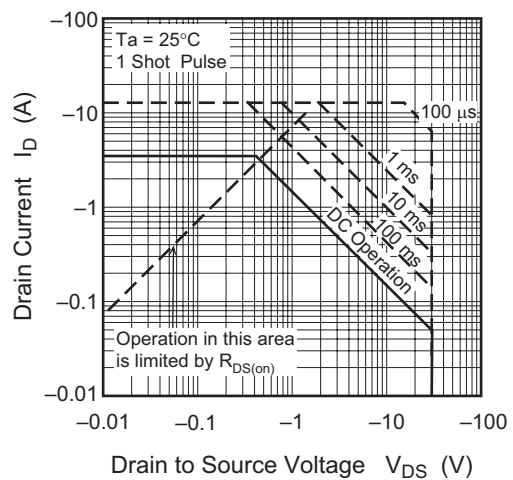
Notes: 3. Pulse test

Main Characteristics

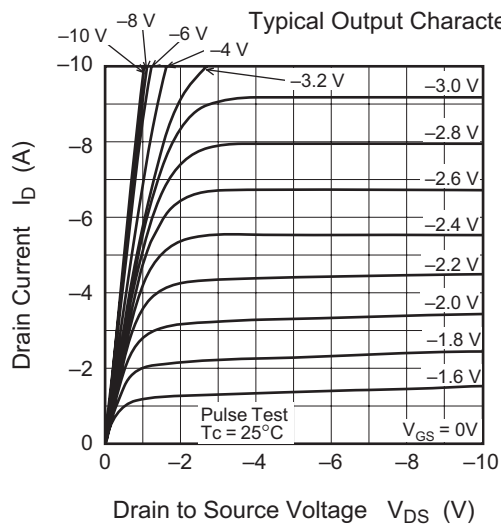
Maximum Channel Power
Dissipation Curve

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

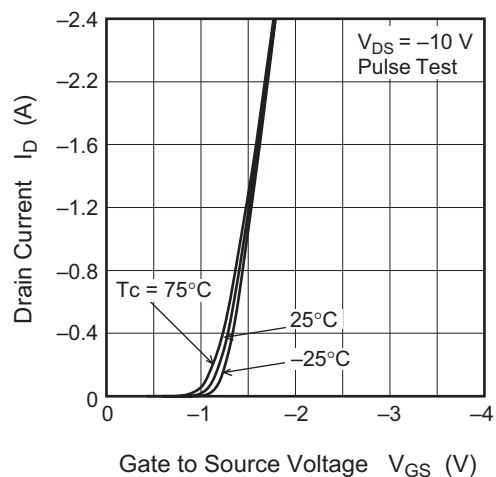
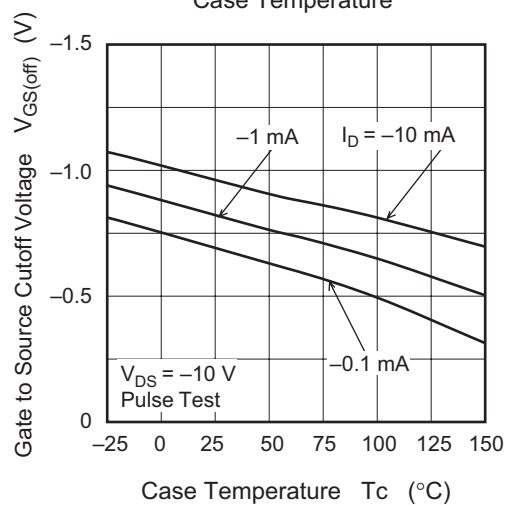
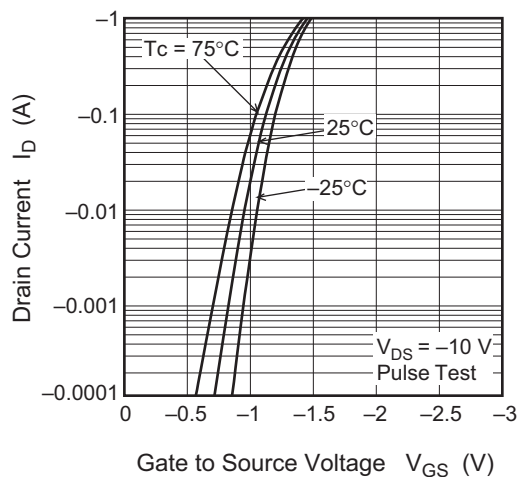
Maximum Safe Operation Area



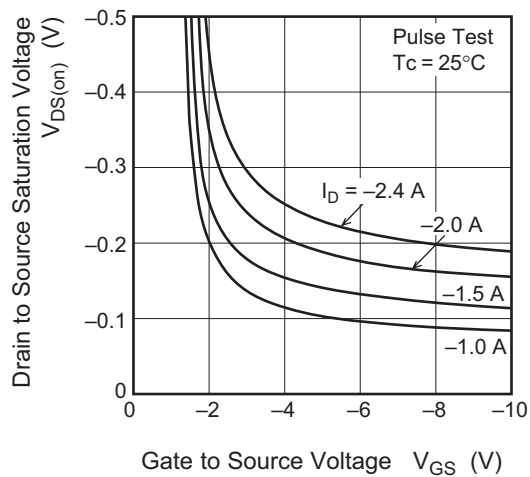
Typical Output Characteristics



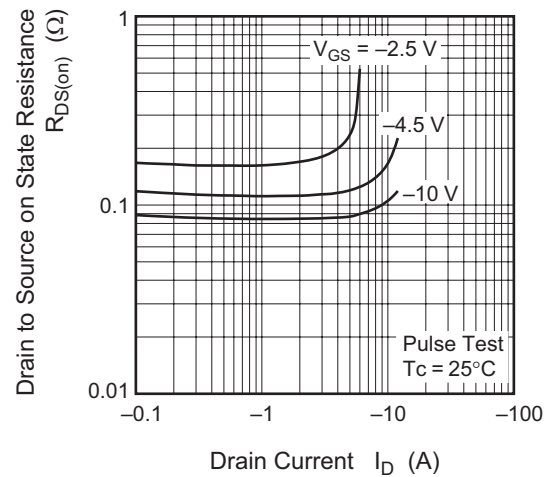
Typical Transfer Characteristics (1)

Gate to Source Cutoff Voltage vs.
Case Temperature

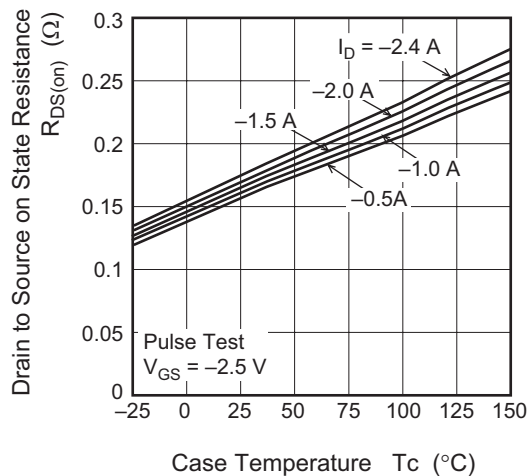
Drain to Source Saturation Voltage vs.
Gate to Source Voltage



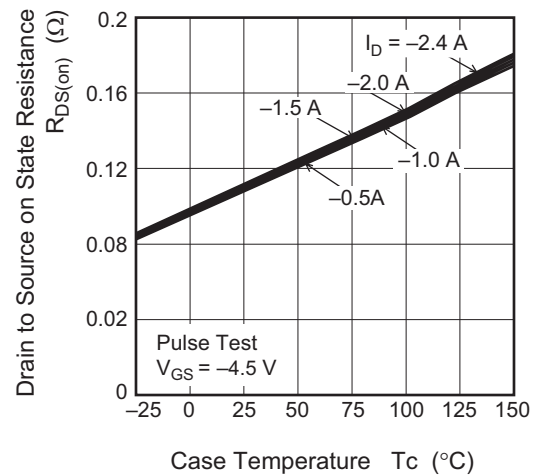
Static Drain to Source on State Resistance
vs. Drain Current



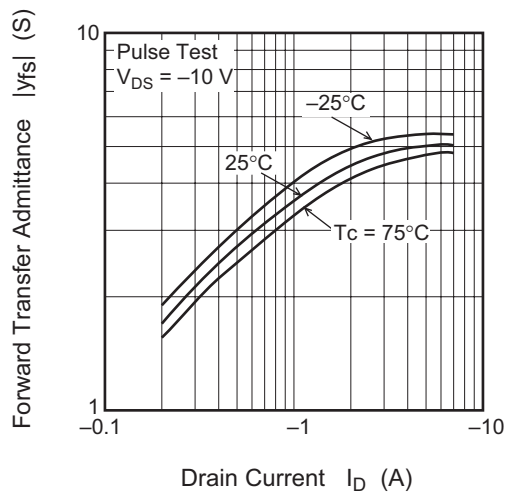
Static Drain to Source on State Resistance
vs. Case Temperature (1)



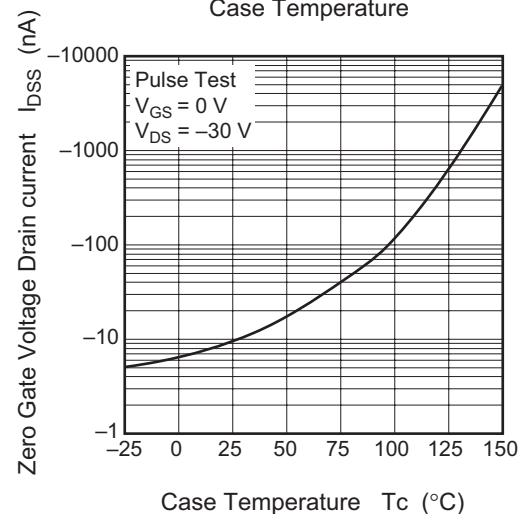
Static Drain to Source on State Resistance
vs. Case Temperature (2)



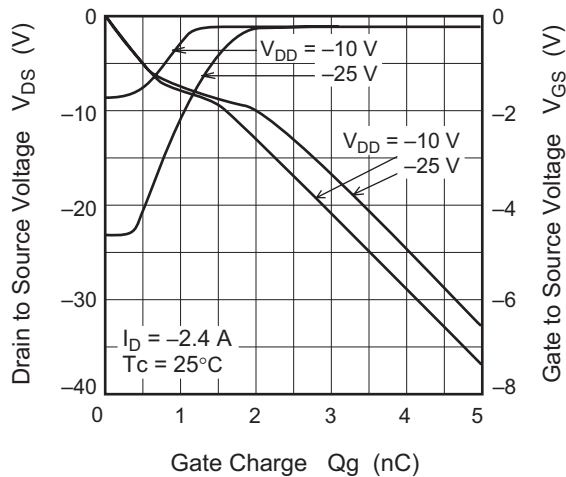
Forward Transfer Admittance vs.
Drain Current



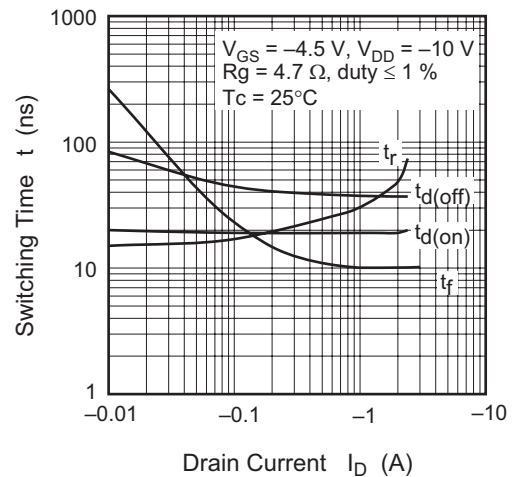
Zero Gate Voltage Drain current vs.
Case Temperature



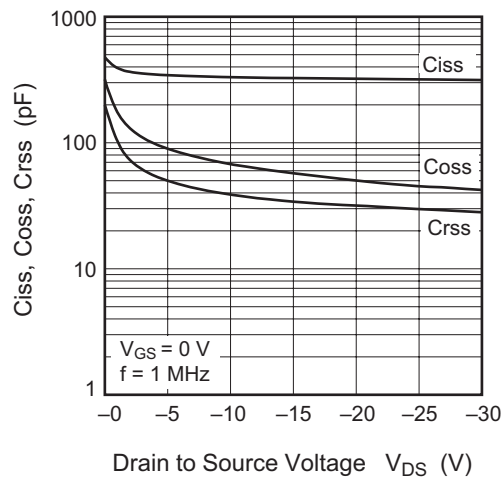
Dynamic Input Characteristics



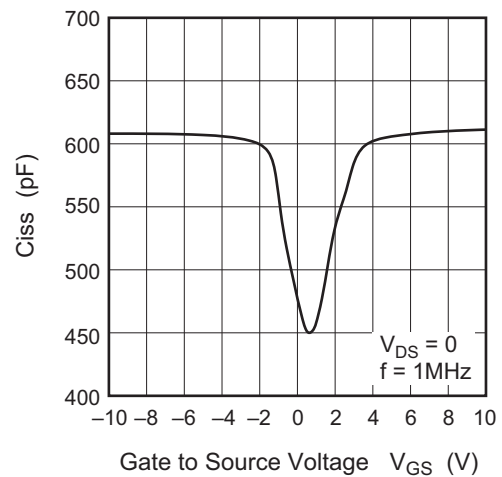
Switching Characteristics



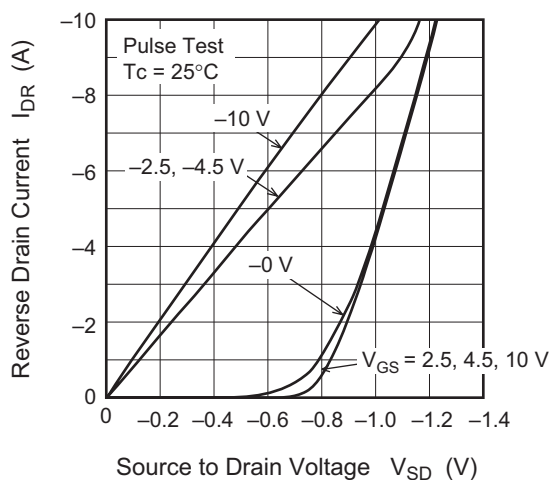
Typical Capacitance vs. Drain to Source Voltage



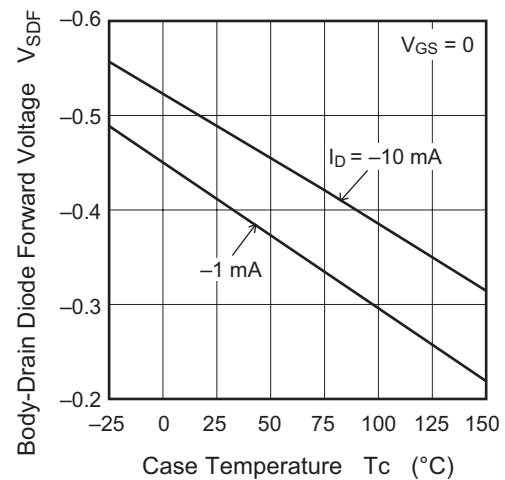
Input Capacitance vs. Gate to Source Voltage



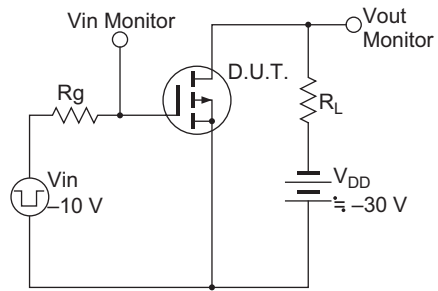
Reverse Drain Current vs. Source to Drain Voltage



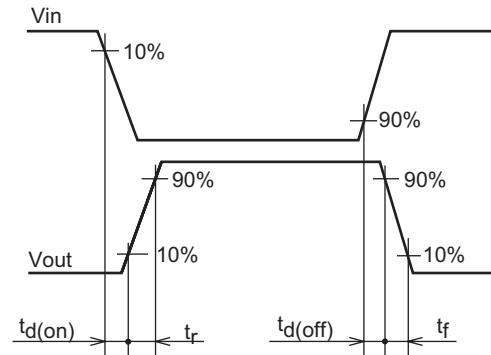
Body-Drain Diode Forward Voltage vs. Case Temperature



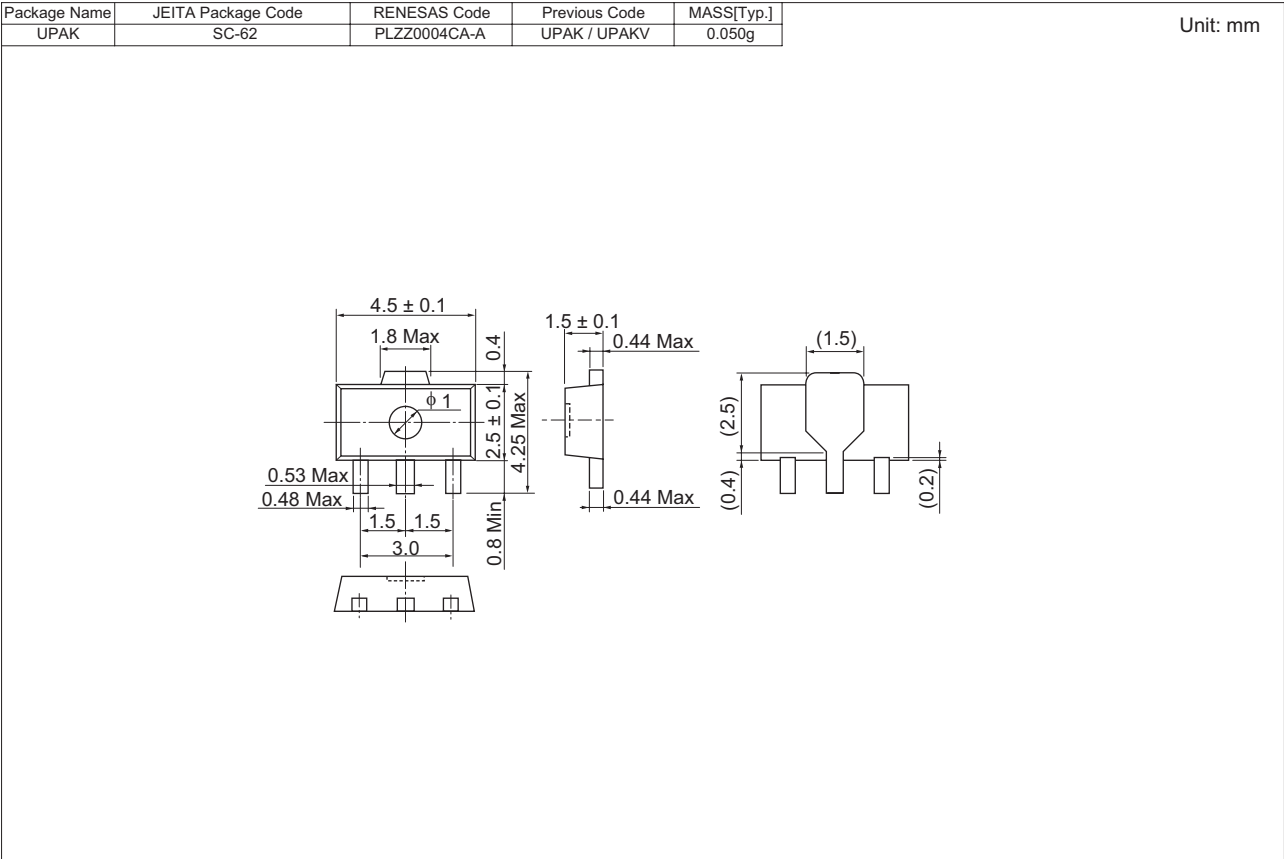
Switching Time Test Circuit



Switching Time Waveform



Package Dimensions



Ordering Information

Part No.	Quantity	Shipping Container
RQJ0305EQDQSTL-E	1000 pcs.	φ178 mm reel, 12 mm Emboss taping

Notes:

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