

# RJK2009DPM

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G0474-0100

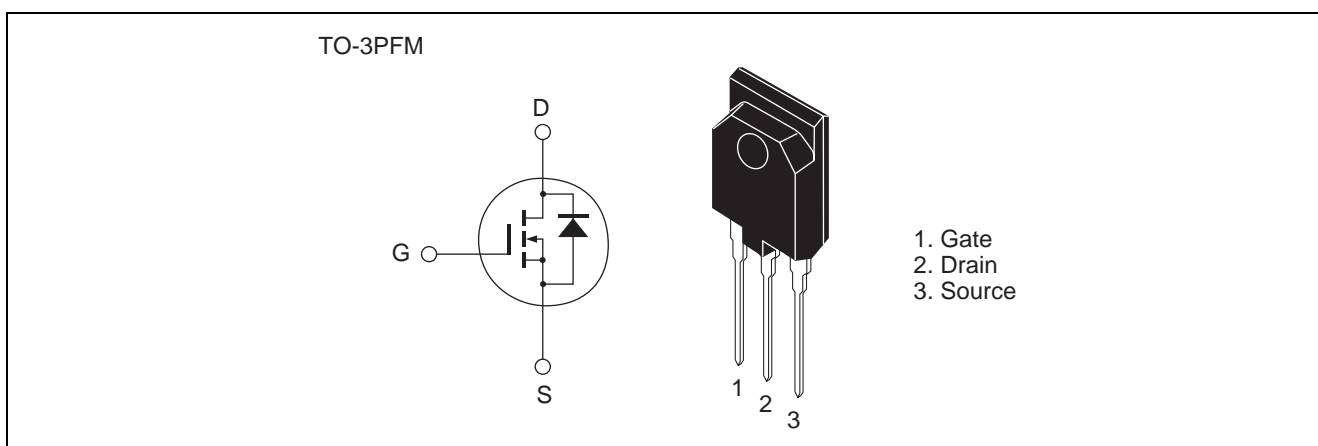
Rev.1.00

Nov.12.2004

## Features

- Low on-resistance
- Low leakage current
- High speed switching

## Outline



## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to Source voltage	$V_{DSS}$	200	V
Gate to Source voltage	$V_{GSS}$	±30	V
Drain current	$I_D$	40	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	160	A
Body-Drain diode reverse Drain current	$I_{DR}$	40	A
Body-Drain diode reverse Drain peak current	$I_{DR(pulse)}$ <sup>Note1</sup>	160	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	40	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	106	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	60	W
Channel to case thermal impedance	$\theta_{ch-c}$	2.08	°C/W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

Notes: 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$

2. Value at  $T_c = 25^\circ C$

3.  $STch = 25^\circ C$ ,  $T_{ch} \leq 150^\circ C$

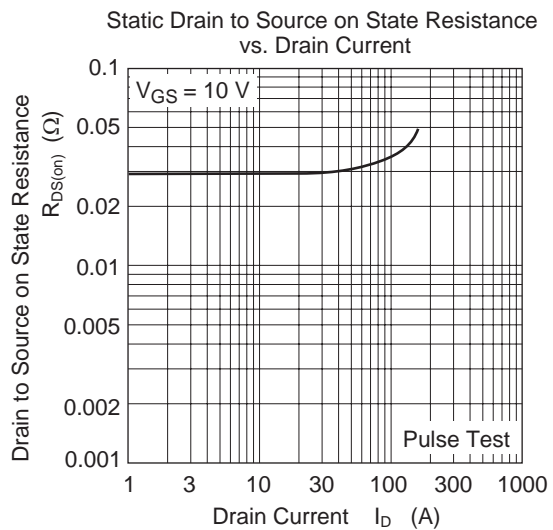
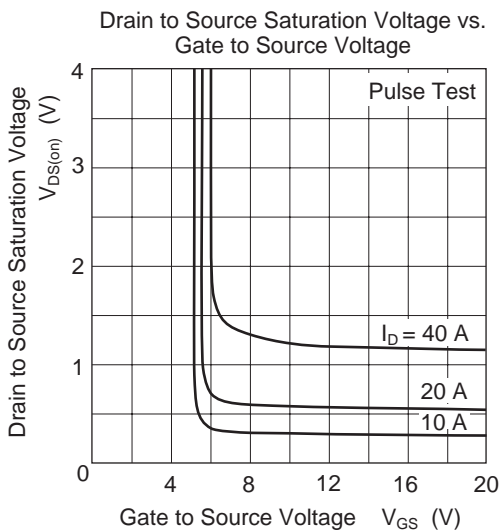
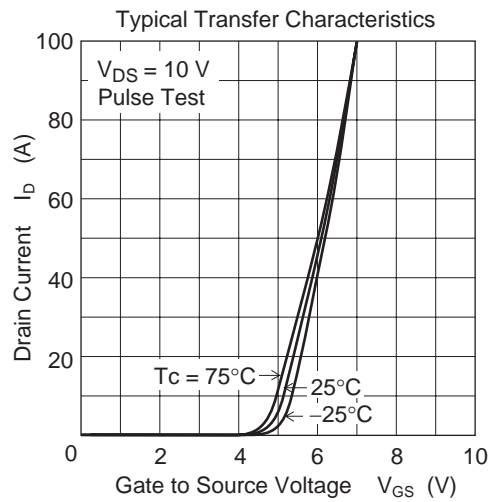
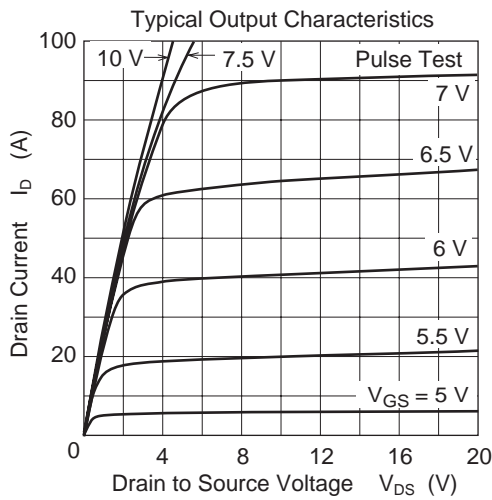
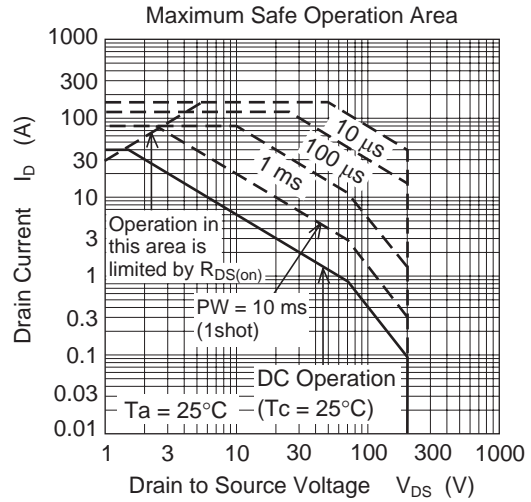
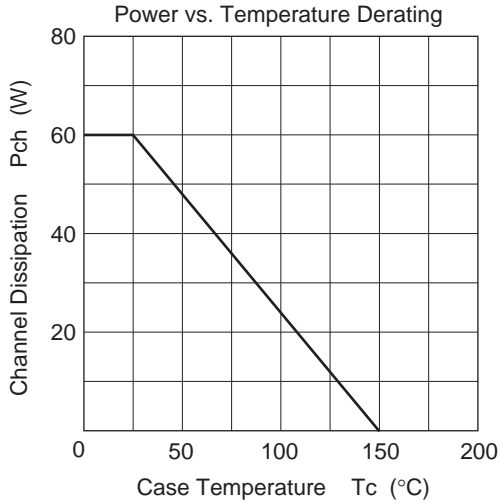
## Electrical Characteristics

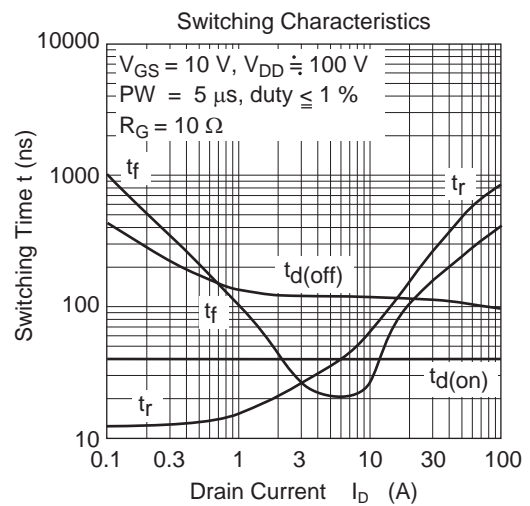
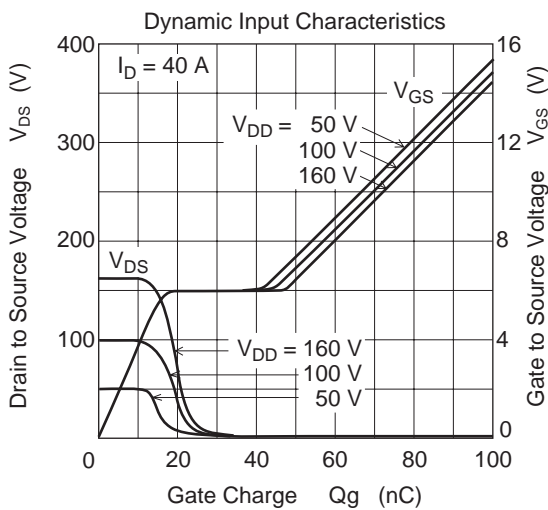
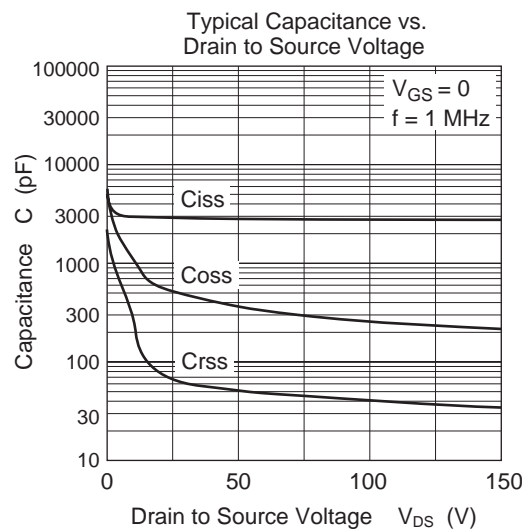
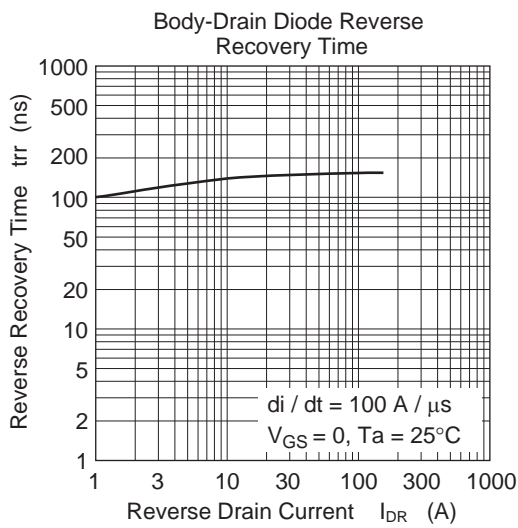
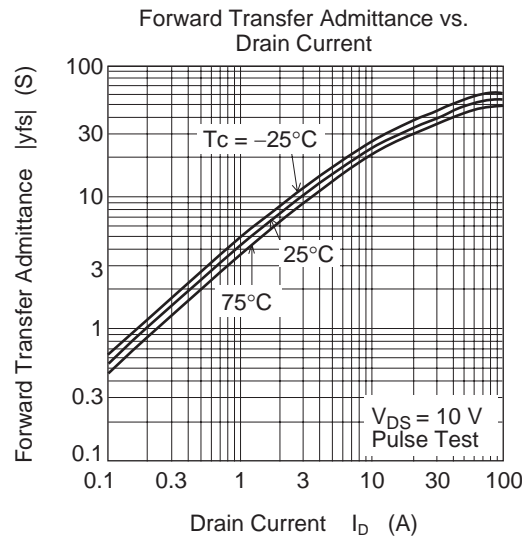
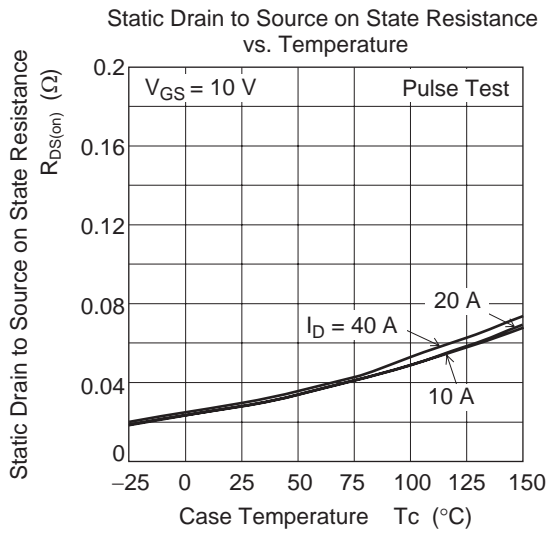
(Ta = 25°C)

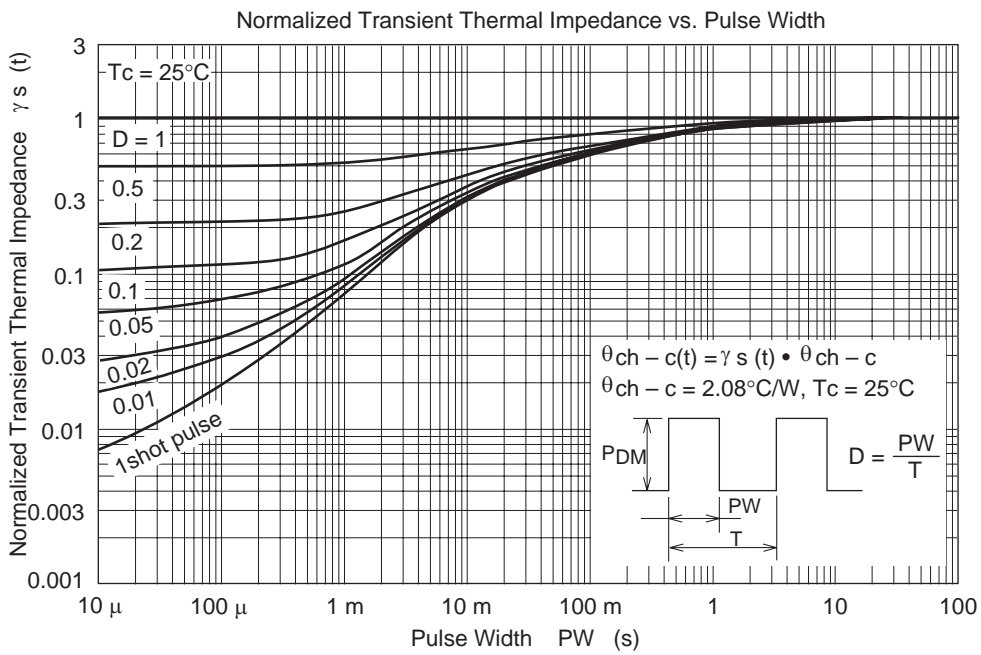
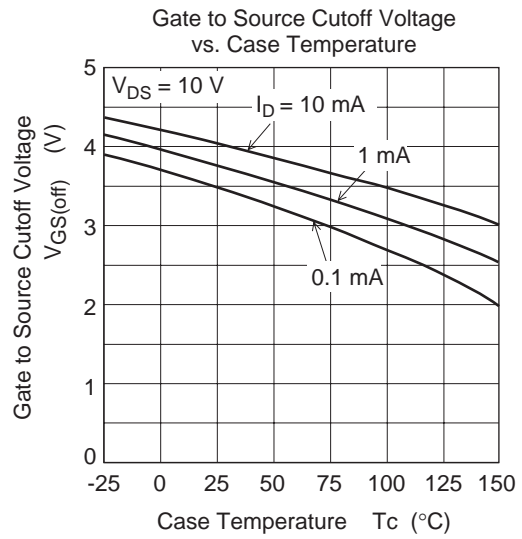
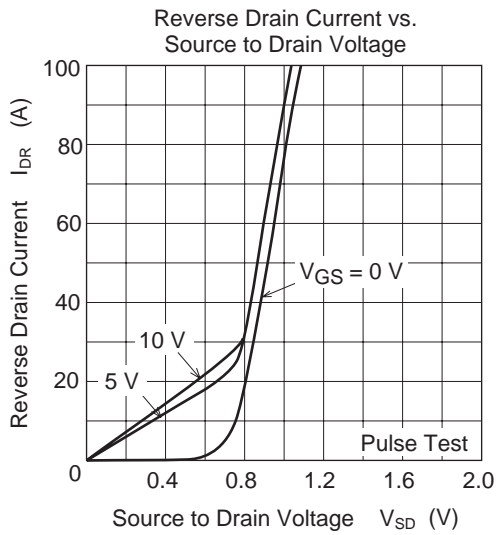
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to Source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero Gate voltage Drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 200 \text{ V}$ , $V_{GS} = 0$
Gate to Source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Gate to Source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Forward transfer admittance	$ y_{fs} $	20	33	—	S	$I_D = 20 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Static Drain to Source on state resistance	$R_{DS(on)}$	—	0.029	0.034	$\Omega$	$I_D = 20 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	2900	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	$C_{oss}$	—	520	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	66	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	40	—	ns	$I_D = 20 \text{ A}$
Rise time	$t_r$	—	160	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	120	—	ns	$R_L = 5 \Omega$
Fall time	$t_f$	—	110	—	ns	$R_g = 10 \Omega$
Total Gate charge	$Q_g$	—	72	—	nC	$V_{DD} = 160 \text{ V}$
Gate to Source charge	$Q_{gs}$	—	16	—	nC	$V_{GS} = 10 \text{ V}$
Gate to Drain charge	$Q_{gd}$	—	31	—	nC	$I_D = 40 \text{ A}$
Body-Drain diode forward voltage	$V_{DF}$	—	0.9	1.4	V	$I_F = 40 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-Drain diode reverse recovery time	$t_{rr}$	—	150	—	ns	$I_F = 40 \text{ A}$ , $V_{GS} = 0$
Body-Drain diode reverse recovery charge	$Q_{rr}$	—	0.8	—	$\mu\text{C}$	$diF/dt = 100 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

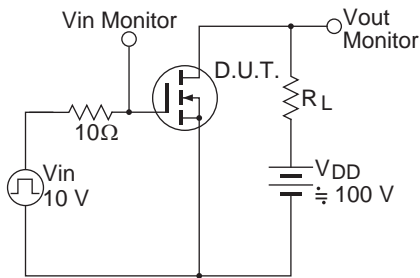
Main Characteristics



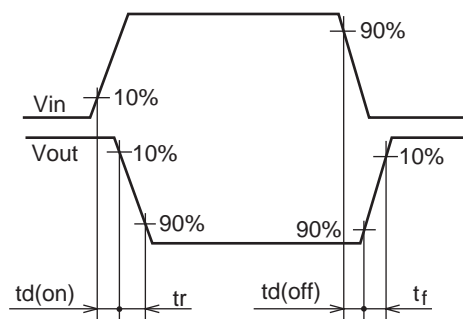




Switching Time Test Circuit

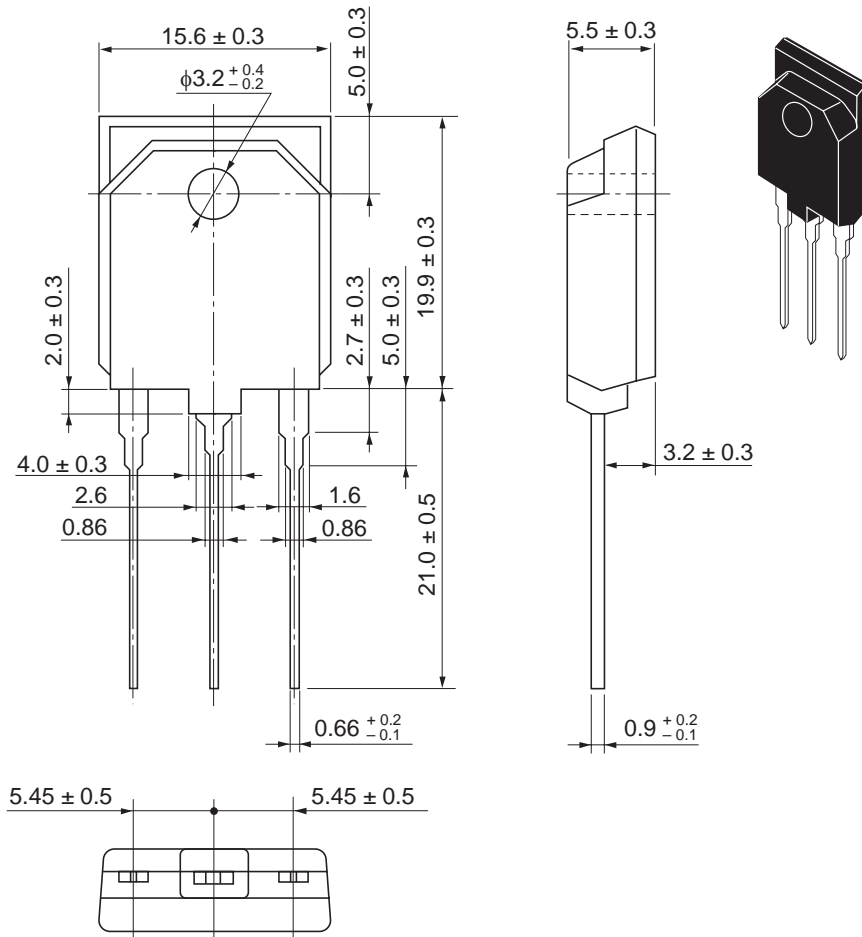


Waveform



Package Dimensions

As of January, 2003  
Unit: mm



Package Code	TO-3PFM
JEDEC	—
JEITA	—
Mass (reference value)	5.2 g

Ordering Information

Part Name	Quantity	Shipping Container
RJK2009DPM-E	30 pcs	Plastic magazine

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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