RJK6014DPP-A0

600V - 16A - MOS FET
High Speed Power Switching

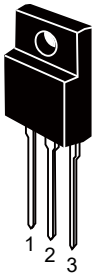
R07DS1425EJ0100
Rev.1.00
Mar.10.2021

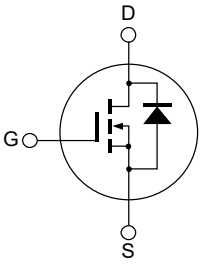
Features

- Low on-resistance
  $R_{DS(on)}$ = 0.475 Ω typ. (at I_D = 8 A, V_{GS} = 10 V, Ta = 25 °C)
- Low leakage current
- High speed switching
- Quality grade: Standard

Outline

RENESAS Package code: PRSS0003AP-A
(Package name: TO-220FPA)





1. Gate
2. Drain
3. Source

Absolute Maximum Ratings

(Ta = 25 °C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	600	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D Notes4	16	A
Drain peak current	$I_{D\ (pulse)}$ Notes1	32	A
Body-drain diode reverse drain current	I_{DR}	16	A
Body-drain diode reverse drain peak current	$I_{DR\ (pulse)}$ Notes1	32	A
Avalanche current	I_{AP} Notes3	4	A
Avalanche energy	E_{AR} Notes3	0.87	mJ
Channel dissipation	Pch Notes2	35	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Note: Continuous heavy condition (e.g. high temperature/voltage/current or high variation of temperature) may affect a reliability even if it is within the absolute maximum ratings. Please consider derating condition for appropriate reliability in reference Renesas Semiconductor Reliability Handbook (Recommendation for Handling and Usage of Semiconductor Devices) and individual reliability data.

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1 %
2. Value at Tc = 25 °C
3. STch = 25 °C, Tch ≤ 150 °C
4. Limited by maximum safe operation area

Thermal Resistance Characteristics

(Ta = 25 °C)

Item	Symbol	Max. Value Notes5	Unit
Channel to case thermal impedance	θch-c	3.57	°C/W

Notes: 5. Designed target value on Renesas measurement condition. (Not tested)

Electrical Characteristics

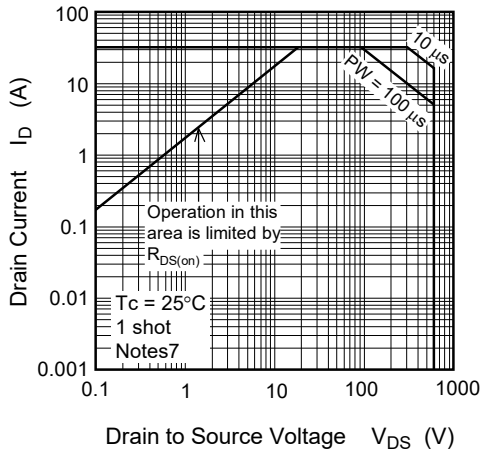
(Ta = 25 °C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	I_D = 10 mA, V_{GS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	V_{DS} = 600 V, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	μA	V_{GS} = ±30 V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	0.475	0.575	Ω	I_D = 8 A, V_{GS} = 10 V Notes6
Input capacitance	Ciss	—	1800	—	pF	V_{DS} = 25 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	170	—	pF	
Reverse transfer capacitance	Crss	—	20	—	pF	
Turn-on delay time	$t_{d(on)}$	—	36	—	ns	I_D = 8 A V_{GS} = 10 V R_L = 37.5 Ω Rg = 10 Ω
Rise time	t_r	—	29	—	ns	
Turn-off delay time	$t_{d(off)}$	—	93	—	ns	
Fall time	t_f	—	20	—	ns	
Total gate charge	Qg	—	45	—	nC	V_{DD} = 480 V V_{GS} = 10 V I_D = 16 A
Gate to source charge	Qgs	—	9	—	nC	
Gate to drain charge	Qgd	—	20	—	nC	
Body-drain diode forward voltage	V_{DF}	—	0.91	1.50	V	I_F = 16 A, V_{GS} = 0 Notes6
Body-drain diode reverse recovery time	t_{rr}	—	390	—	ns	I_F = 16 A, V_{GS} = 0 di_F/dt = 100 A/μs

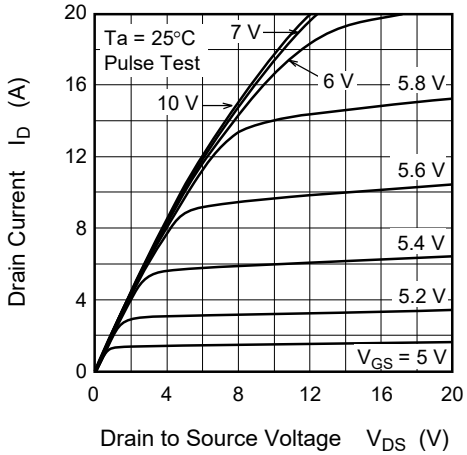
Notes: 6. Pulse test

Main Characteristics

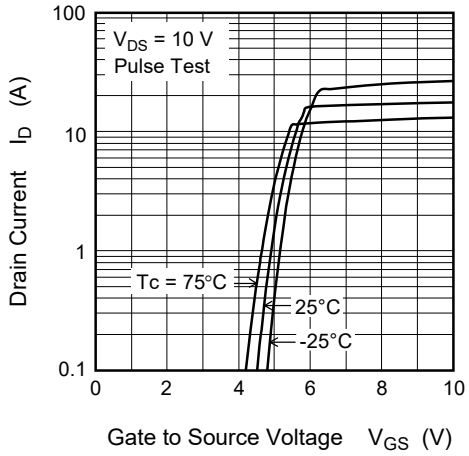
Maximum Safe Operation Area



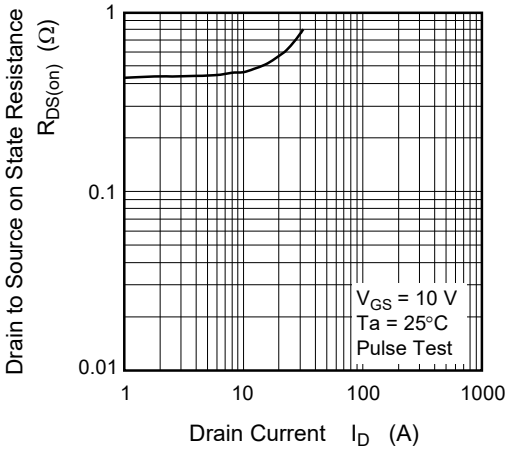
Typical Output Characteristics



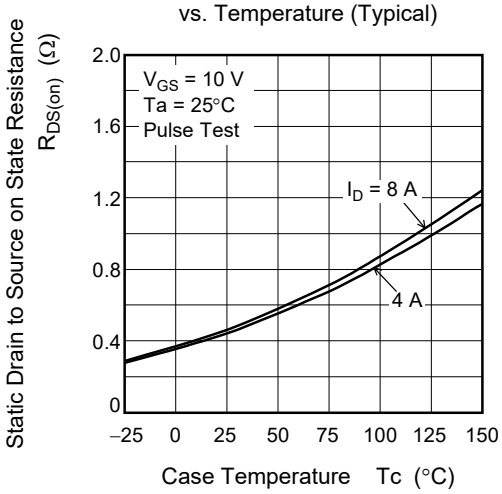
Typical Transfer Characteristics



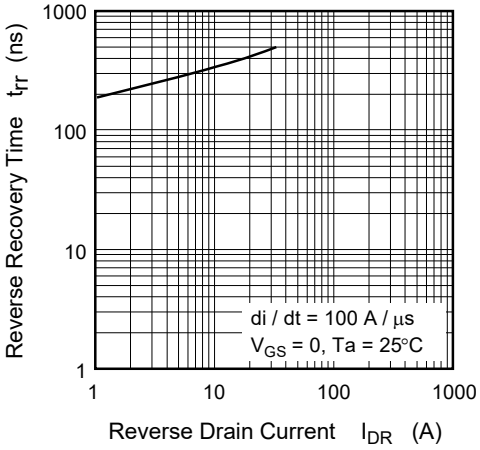
Static Drain to Source on State Resistance vs. Drain Current (Typical)



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

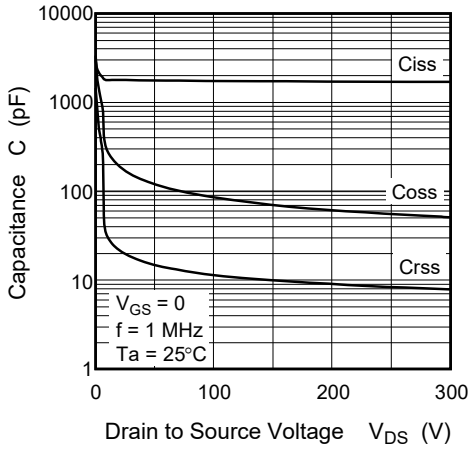


Body-Drain Diode Reverse Recovery Time (Typical)

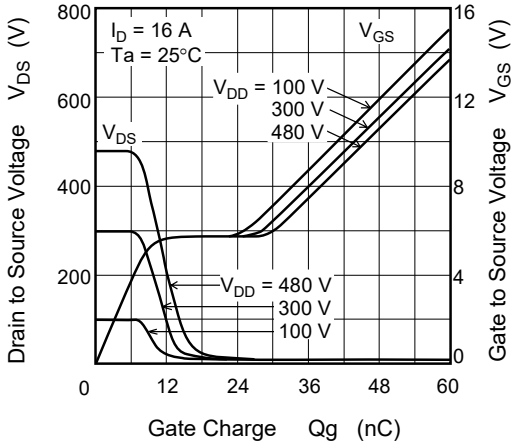


Notes: 7. Designed target value on Renesas measurement condition. (Not tested)
Renesas recommends that operating conditions are designed according to a document “Power MOS FET・IGBT Attention of Handling Semiconductor Devices”.

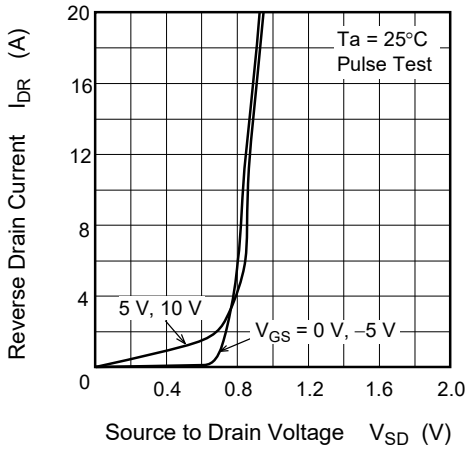
Typical Capacitance vs.
Drain to Source Voltage



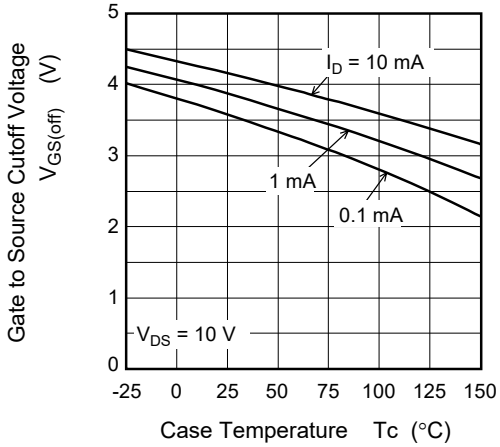
Dynamic Input Characteristics (Typical)



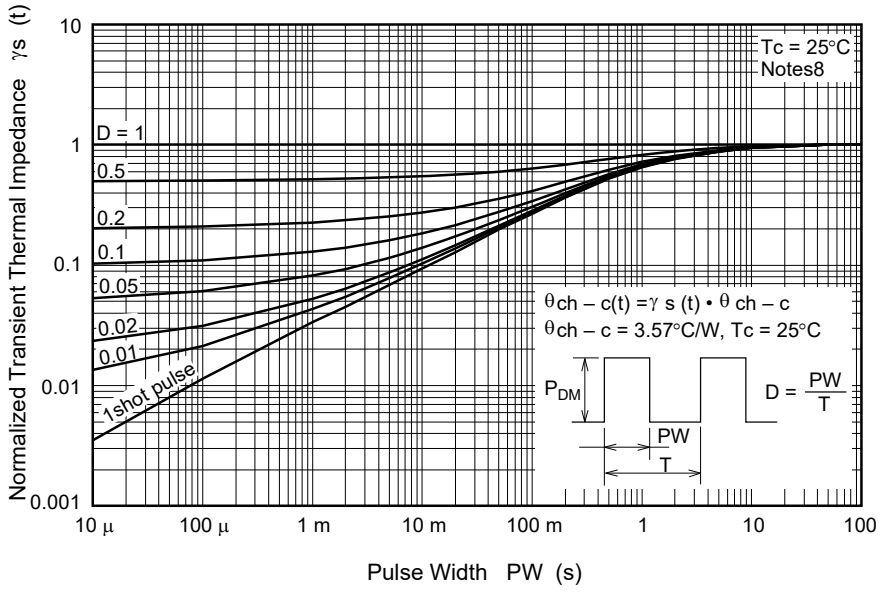
Reverse Drain Current vs.
Source to Drain Voltage (Typical)



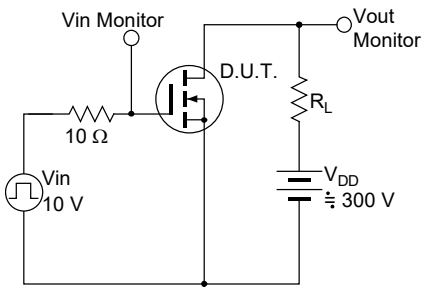
Gate to Source Cutoff Voltage
vs. Case Temperature (Typical)



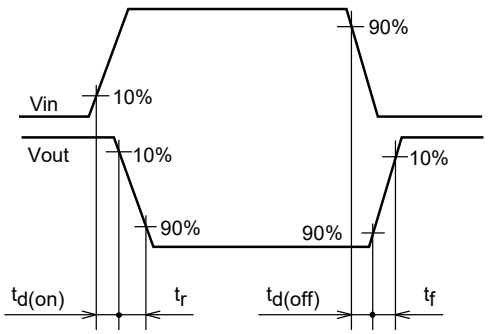
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveform

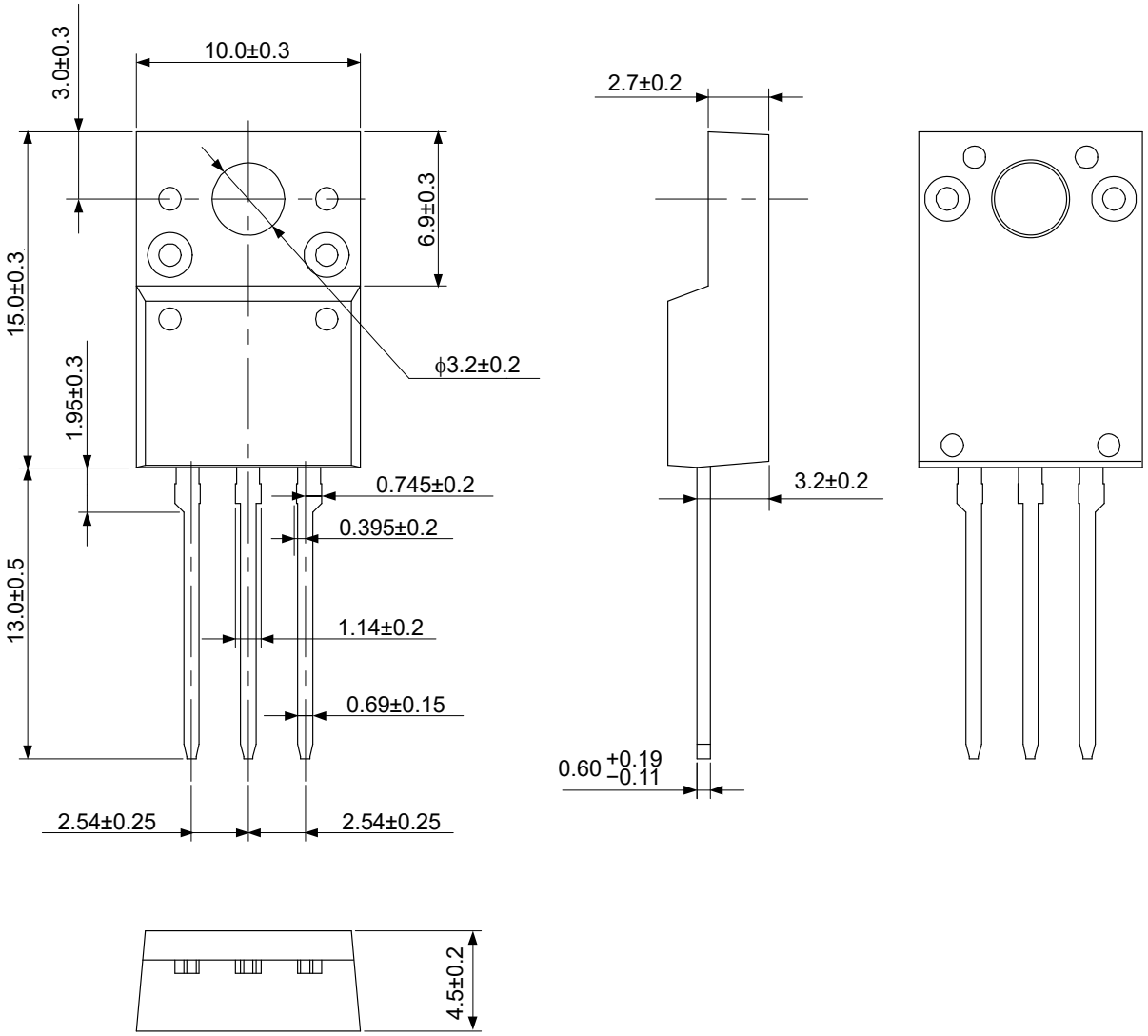


Notes: 8. Designed target value on Renesas measurement condition. (Not tested)

Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS (Typ) [g]
TO-220FPA	—	PRSS0003AP-A	TO-220FPA	1.65

Unit: mm



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Ordering Information

Orderable Part No.	Quantity	Shipping Container
RJK6014DPP-A0#T2	2500 pcs	Box (Tube)

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(Rev.5.0-1 October 2020)

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