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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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Not recommended
for new design

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FS70UM-2

High-Speed Switching Use
Nch Power MOS FET

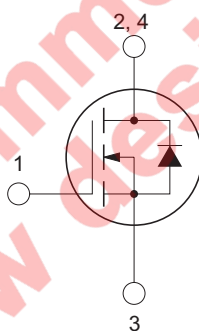
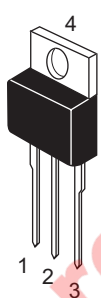
REJ03G1434-0200
(Previous: MEJ02G0108-0101)
Rev.2.00
Aug 07, 2006

Features

- Drive voltage : 10 V
- V_{DSS} : 100 V
- $r_{DS(ON) (max)}$: 20 m Ω
- I_D : 70 A
- Integrated Fast Recovery Diode (TYP.) : 120 ns

Outline

RENESAS Package code: PRSS0004AA-A
(Package name: TO-220)



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

Applications

Motor control, Lamp control, Solenoid control, DC-DC converters, etc.

Maximum Ratings

(T_c = 25°C)

Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	100	V	$V_{GS} = 0$ V
Gate-source voltage	V_{GSS}	± 20	V	$V_{DS} = 0$ V
Drain current	I_D	70	A	
Drain current (Pulsed)	I_{DM}	280	A	
Avalanche drain current (Pulsed)	I_{DA}	70	A	$L = 100$ μ H
Source current	I_S	70	A	
Source current (Pulsed)	I_{SM}	280	A	
Maximum power dissipation	P_D	125	W	
Channel temperature	T _{ch}	- 55 to +150	°C	
Storage temperature	T _{stg}	- 55 to +150	°C	
Mass	—	2.0	g	Typical value

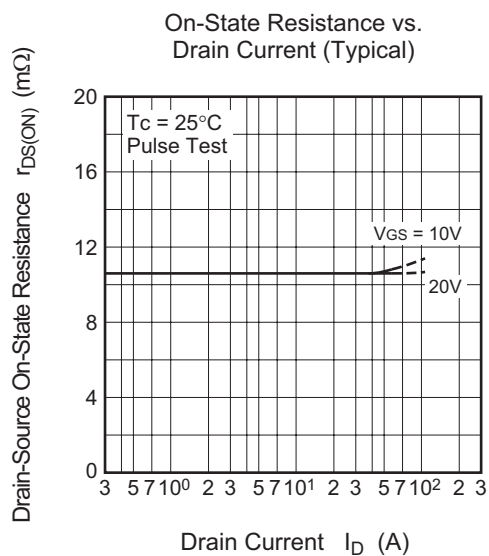
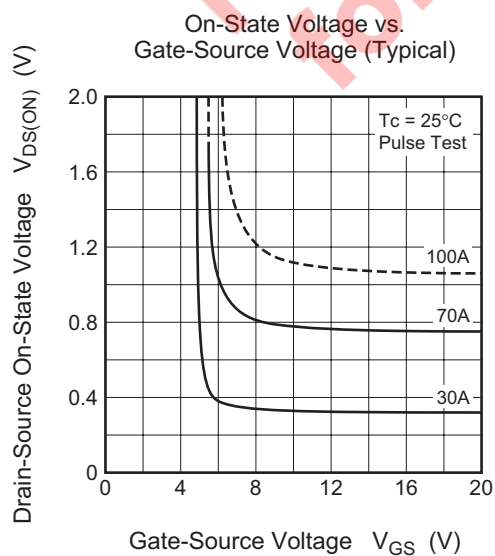
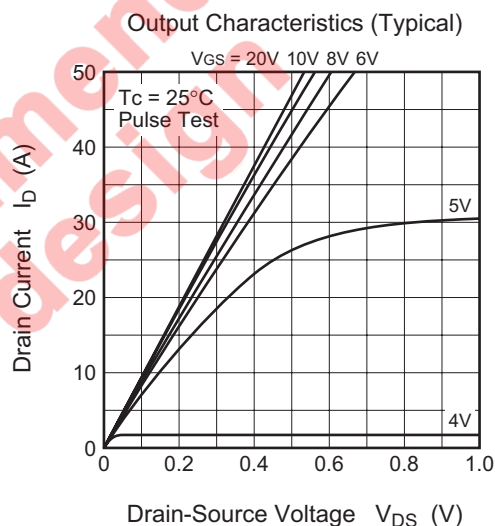
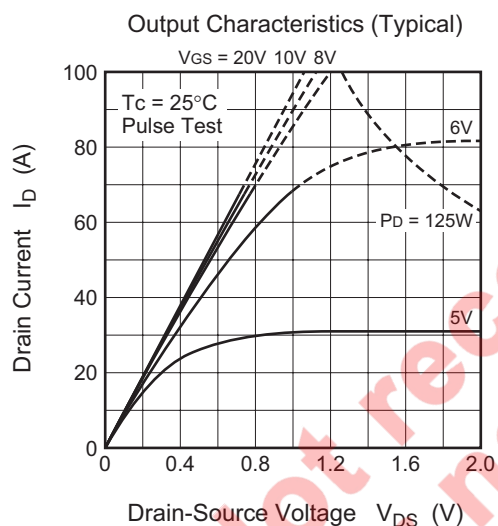
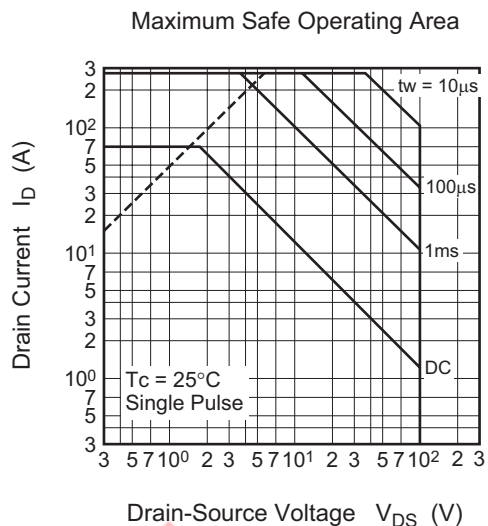
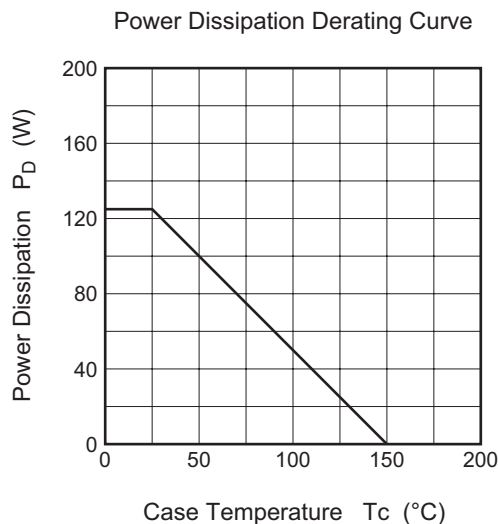
Electrical Characteristics

(Tch = 25°C)

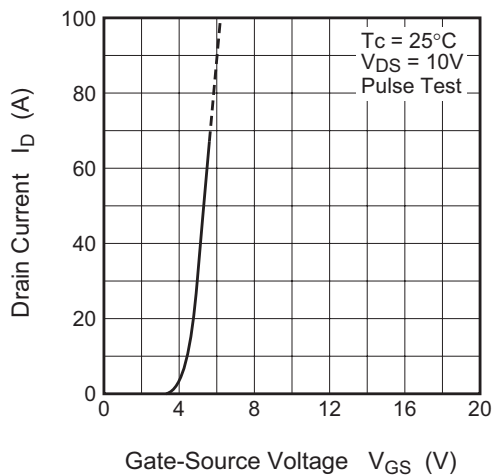
Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	100	—	—	V	$I_D = 1 \text{ mA}$, $V_{GS} = 0 \text{ V}$
Gate-source leakage current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0 \text{ V}$
Drain-source leakage current	I_{DSS}	—	—	0.1	mA	$V_{DS} = 100 \text{ V}$, $V_{GS} = 0 \text{ V}$
Gate-source threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	14	20	$\text{m}\Omega$	$I_D = 35 \text{ A}$, $V_{GS} = 10 \text{ V}$
Drain-source on-state voltage	$V_{DS(ON)}$	—	0.49	0.7	V	$I_D = 35 \text{ A}$, $V_{GS} = 10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	—	53	—	S	$I_D = 35 \text{ A}$, $V_{DS} = 10 \text{ V}$
Input capacitance	C_{iss}	—	6540	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	1150	—	pF	
Reverse transfer capacitance	C_{rss}	—	500	—	pF	
Turn-on delay time	$t_{d(on)}$	—	95	—	ns	$V_{DD} = 50 \text{ V}$, $I_D = 35 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_{GEN} = R_{GS} = 50 \Omega$
Rise time	t_r	—	175	—	ns	
Turn-off delay time	$t_{d(off)}$	—	330	—	ns	
Fall time	t_f	—	190	—	ns	
Source-drain voltage	V_{SD}	—	1.0	1.5	V	$I_S = 35 \text{ A}$, $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	1.00	$^{\circ}\text{C/W}$	Channel to case
Reverse recovery time	t_{rr}	—	120	—	ns	$I_S = 70 \text{ A}$, $d_i/d_t = -100 \text{ A}/\mu\text{s}$

Not recommended
for new design

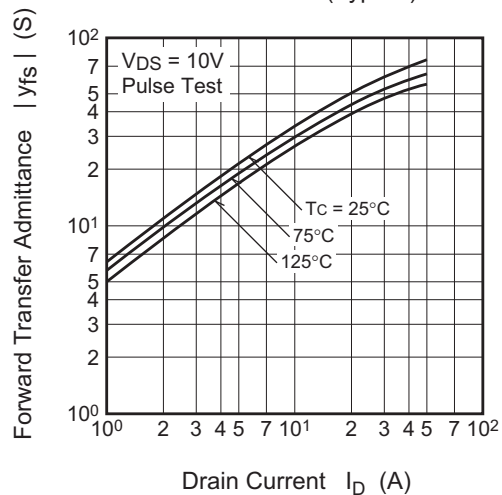
Performance Curves



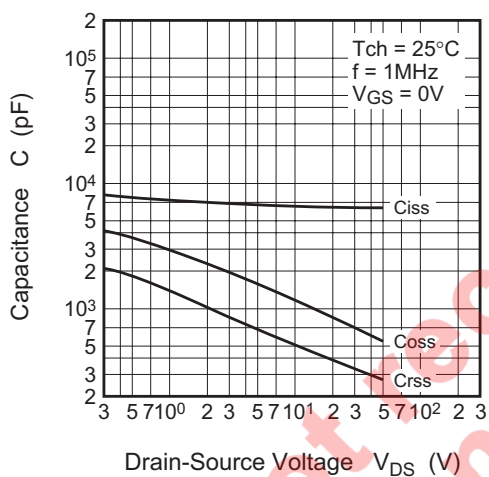
Transfer Characteristics (Typical)



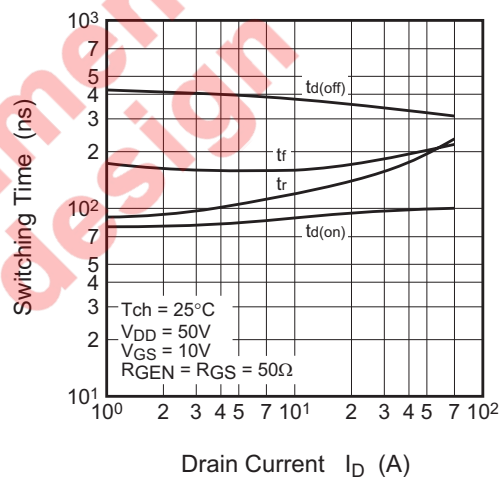
Forward Transfer Admittance vs. Drain Current (Typical)



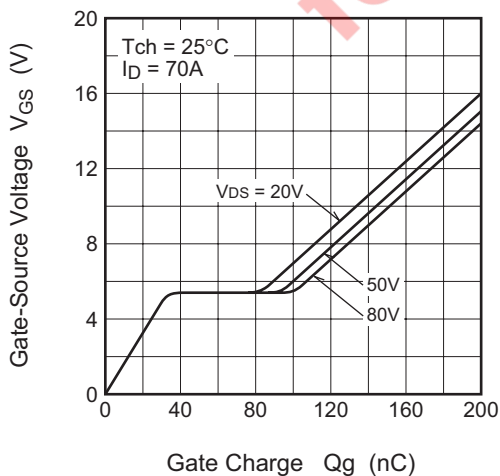
Capacitance vs. Drain-Source Voltage (Typical)



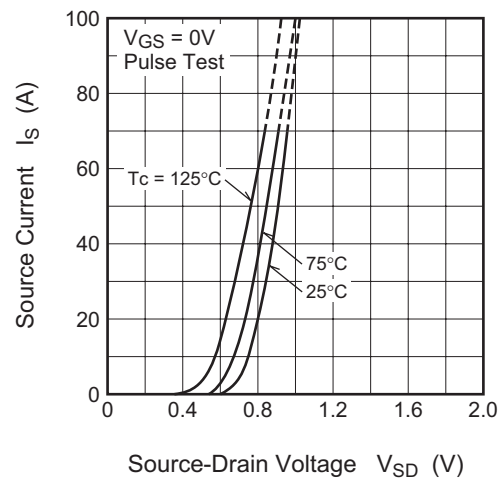
Switching Characteristics (Typical)

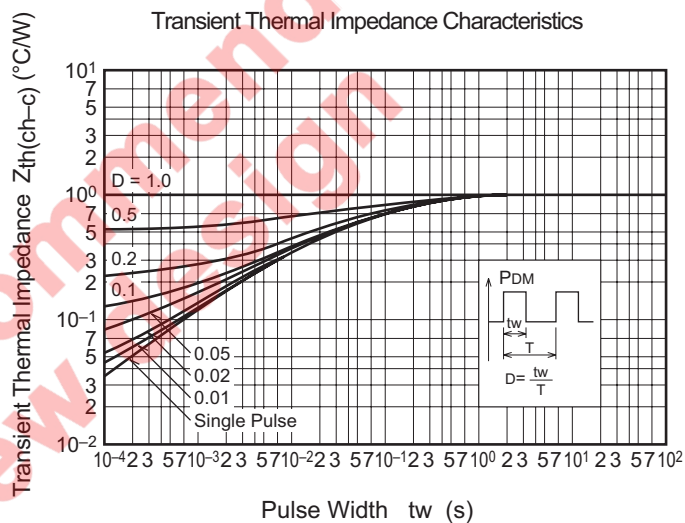
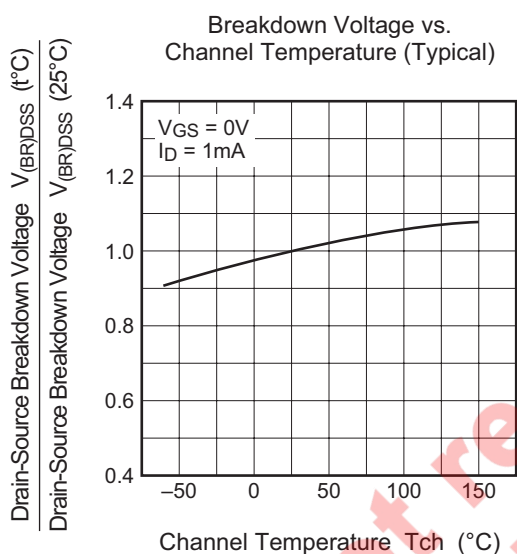
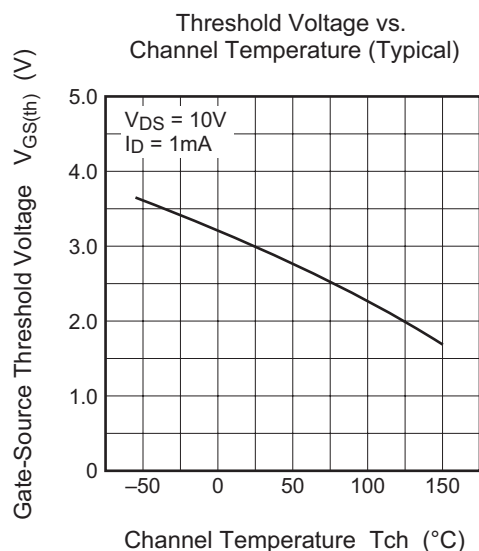
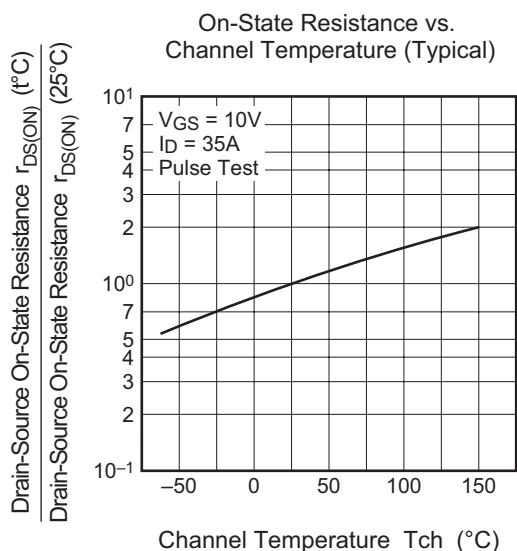


Gate-Source Voltage vs. Gate Charge (Typical)

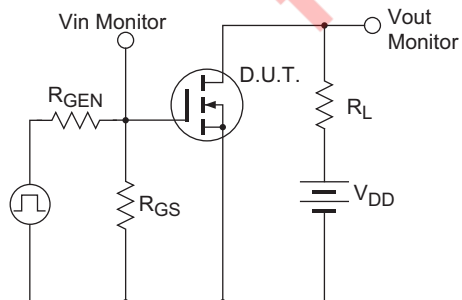


Source-Drain Diode Forward Characteristics (Typical)

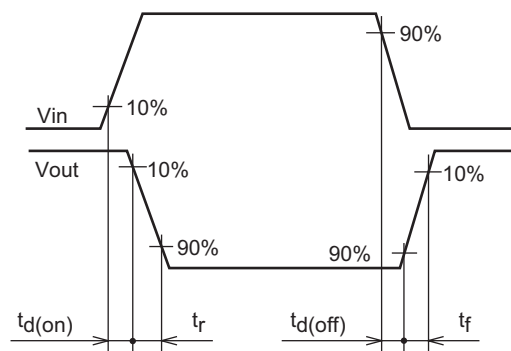




Switching Time Measurement Circuit



Switching Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
TO-220	SC-46	PRSS0004AA-A	—	2.0g	

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Static electricity prevention bag	100	Type name	FS70UM-2
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FS70UM-2-A8

Note : Please confirm the specification about the shipping in detail.

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