

FS10AS-3

High-Speed Switching Use
Nch Power MOS FET

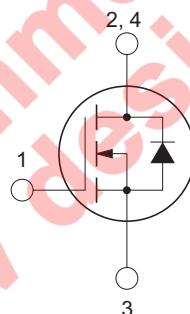
REJ03G1407-0200
(Previous: MEJ02G0111-0101)
Rev.2.00
Aug 07, 2006

Features

- Drive voltage : 10 V
- V_{DSS} : 150 V
- $r_{DS(ON) (max)}$: 170 m Ω
- I_D : 10 A
- Integrated Fast Recovery Diode (TYP.) : 100 ns

Outline

RENESAS Package code: PRSS0004ZA-A
(Package name: MP-3A)



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)

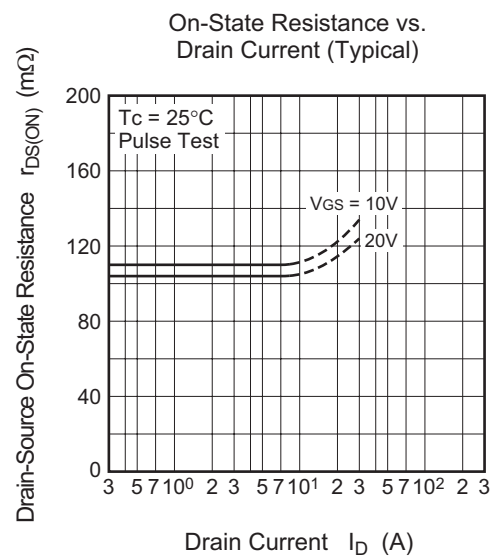
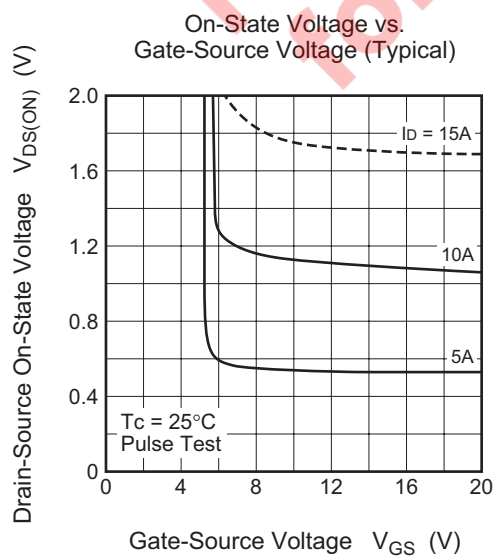
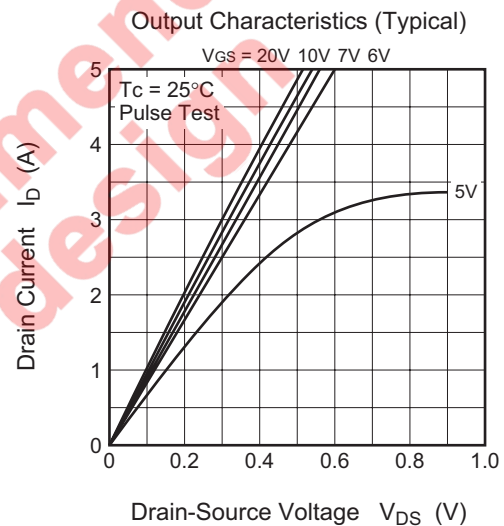
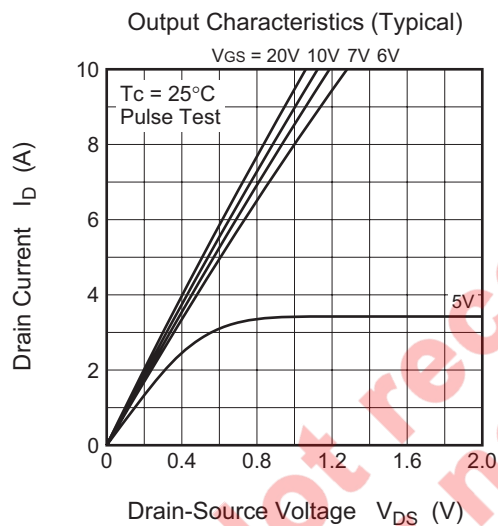
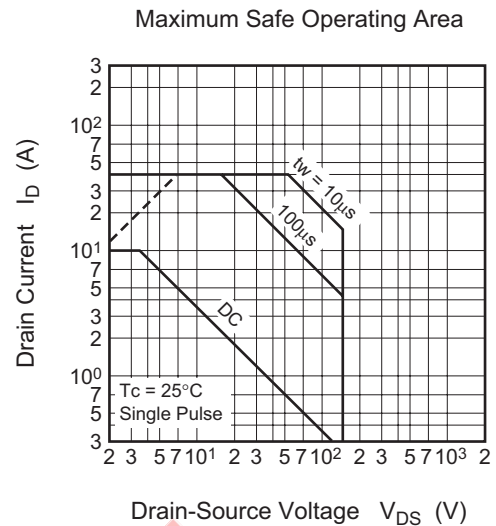
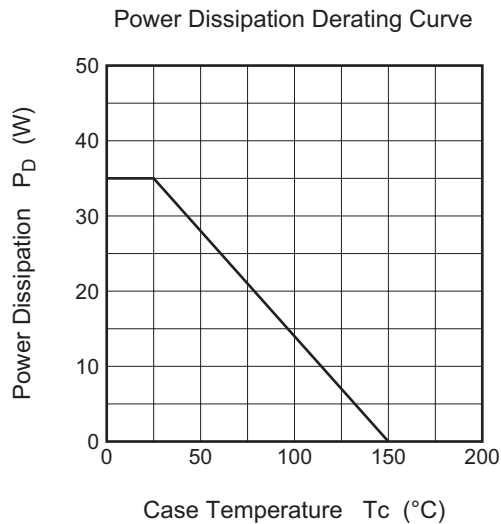
Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	150	V	$V_{GS} = 0$ V
Gate-source voltage	V_{GSS}	±20	V	$V_{DS} = 0$ V
Drain current	I_D	10	A	
Drain current (Pulsed)	I_{DM}	40	A	
Avalanche drain current (Pulsed)	I_{DA}	10	A	L = 100 μ H
Source current	I_S	10	A	
Source current (Pulsed)	I_{SM}	40	A	
Maximum power dissipation	P_D	35	W	
Channel temperature	T _{ch}	– 55 to +150	°C	
Storage temperature	T _{stg}	– 55 to +150	°C	
Mass	—	0.32	g	Typical value

Electrical Characteristics

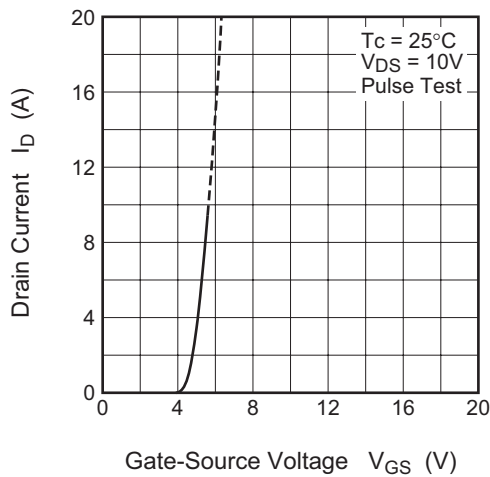
(Tch = 25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	150	—	—	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	$V_{DS} = 150 \text{ V}$, $V_{GS} = 0 \text{ V}$
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	$r_{DS(ON)}$	—	122	170	$\text{m}\Omega$	$I_D = 5 \text{ A}$, $V_{GS} = 10 \text{ V}$
Drain-source on-state voltage	$V_{DS(ON)}$	—	0.61	0.85	V	$I_D = 5 \text{ A}$, $V_{GS} = 10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	—	12	—	S	$I_D = 5 \text{ A}$, $V_{DS} = 10 \text{ V}$
Input capacitance	C_{iss}	—	1250	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	175	—	pF	
Reverse transfer capacitance	C_{rss}	—	75	—	pF	
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$V_{DD} = 80 \text{ V}$, $I_D = 5 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_{GEN} = R_{GS} = 50 \Omega$
Rise time	t_r	—	30	—	ns	
Turn-off delay time	$t_{d(off)}$	—	60	—	ns	
Fall time	t_f	—	34	—	ns	
Source-drain voltage	V_{SD}	—	1.0	1.5	V	$I_S = 5 \text{ A}$, $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	3.57	$^{\circ}\text{C/W}$	Channel to case
Reverse recovery time	t_{rr}	—	100	—	ns	$I_S = 10 \text{ A}$, $d_i/d_t = -100 \text{ A}/\mu\text{s}$

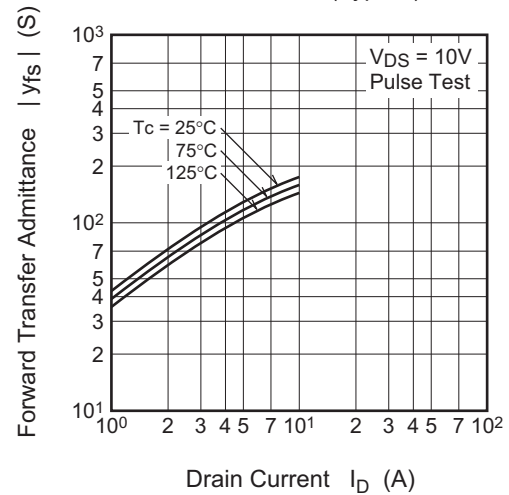
Performance Curves



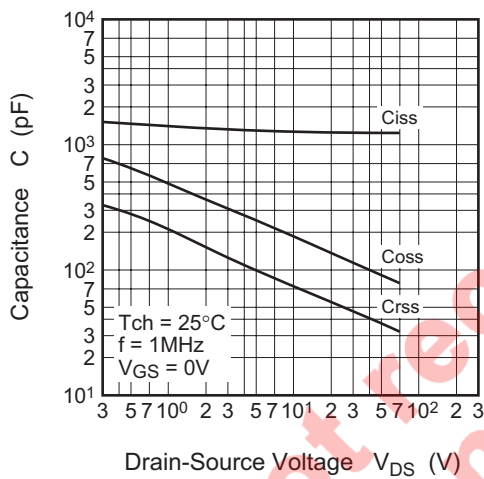
Transfer Characteristics (Typical)



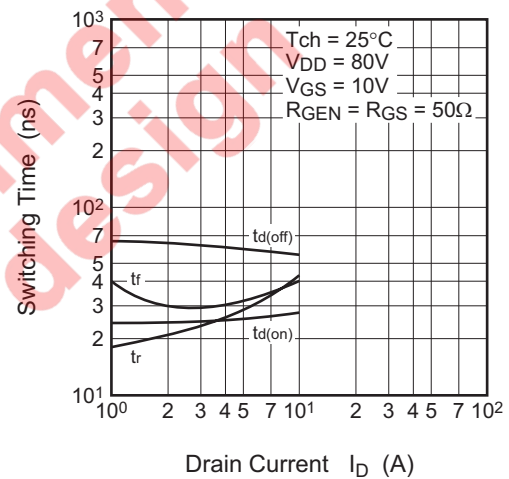
Forward Transfer Admittance vs. Drain Current (Typical)



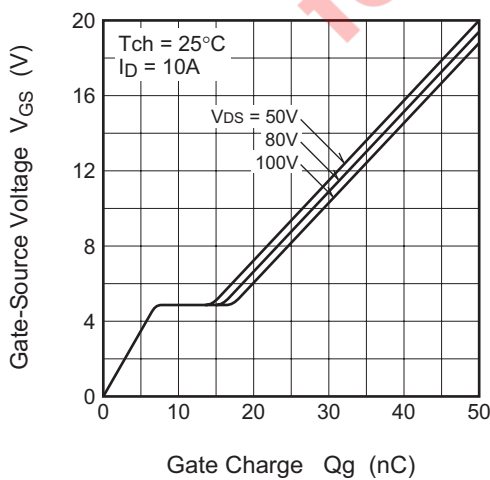
Capacitance vs. Drain-Source Voltage (Typical)



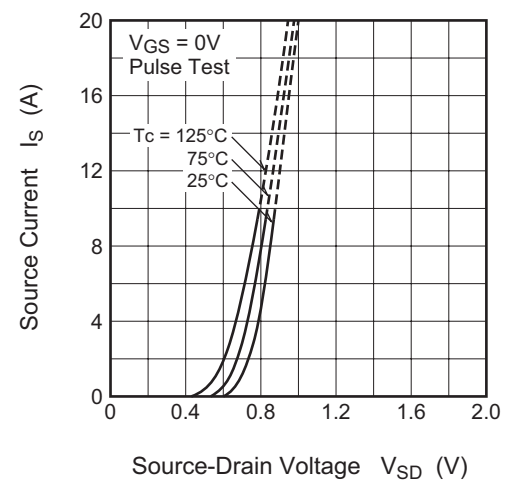
Switching Characteristics (Typical)

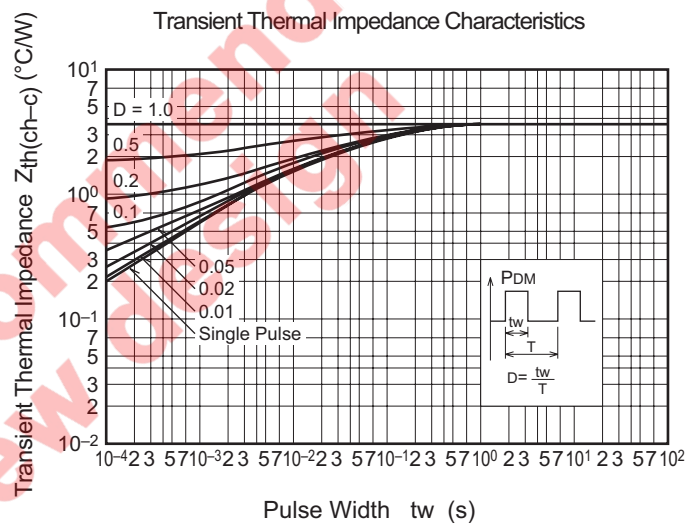
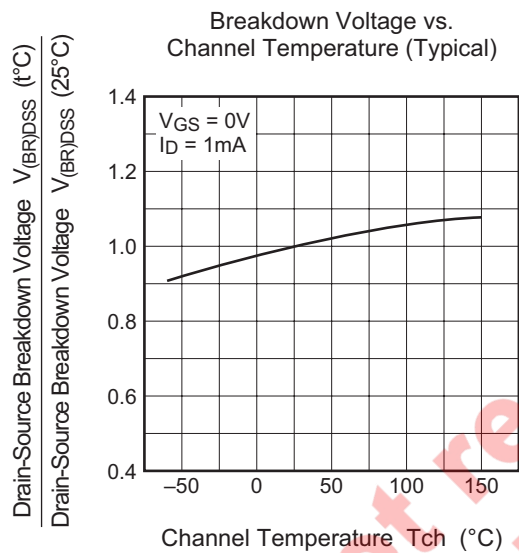
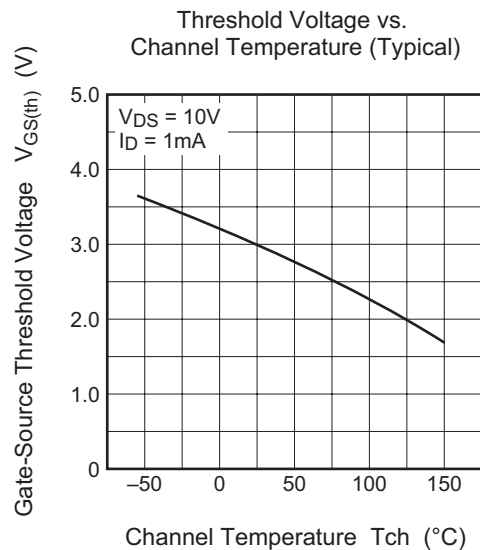
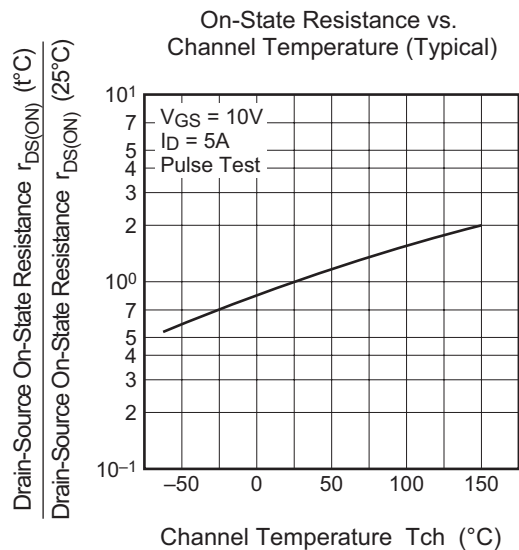


Gate-Source Voltage vs. Gate Charge (Typical)

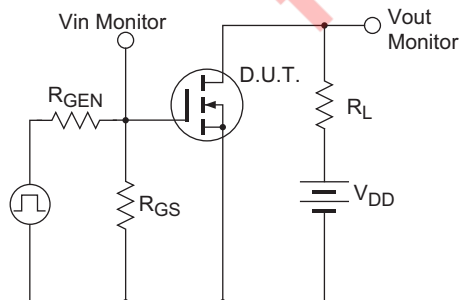


Source-Drain Diode Forward Characteristics (Typical)

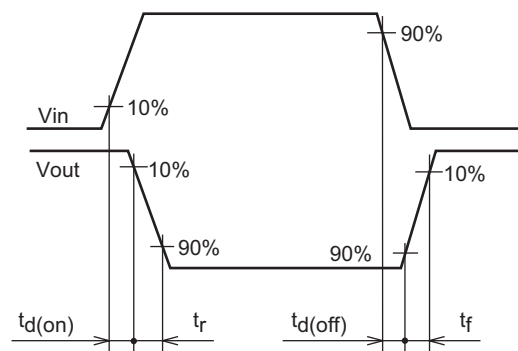




Switching Time Measurement Circuit



Switching Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]	Unit: mm
MP-3A	SC-63	PRSS0004ZA-A	—	0.32g	

The drawing shows the mechanical dimensions of the FS10AS-3 package. The top view shows a rectangular body with a width of 6.6 mm and a length of 5.3 ± 0.2 mm. The side view shows a height of 1 ± 0.2 mm and a total length of 10.4 mm (6.1 ± 0.2 mm + 4.3 mm). The bottom view shows a width of 2.3 ± 0.2 mm and a length of 0.76 ± 0.2 mm. The package has a central lead with a width of 0.76 mm and a height of 1 mm. The side view also shows a lead height of 0.5 ± 0.2 mm and a lead width of 0.1 ± 0.1 mm. The bottom view shows a lead width of 0.5 ± 0.2 mm and a lead height of 1.4 ± 0.2 mm.

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Surface-mounted type	Taping	3000	Type name – T +Direction (1 or 2) +3	FS10AS-3-T13
Surface-mounted type	Plastic Magazine (Tube)	75	Type name	FS10AS-3

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

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Tel: <1> (408) 382-7500, Fax: <1> (408) 382-7501

Renesas Technology Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K.
Tel: <44> (1628) 585-100, Fax: <44> (1628) 585-900

Renesas Technology (Shanghai) Co., Ltd.

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Renesas Technology Hong Kong Ltd.

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Tel: <852> 2265-6688, Fax: <852> 2730-6071

Renesas Technology Taiwan Co., Ltd.

10th Floor, No.99, Fushing North Road, Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology Singapore Pte. Ltd.

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Tel: <65> 6213-0200, Fax: <65> 6278-8001

Renesas Technology Korea Co., Ltd.

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Tel: <82> (2) 796-3115, Fax: <82> (2) 796-2145

Renesas Technology Malaysia Sdn. Bhd

Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No.18, Jalan Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
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