

FX6ASJ-03

High-Speed Switching Use
Pch Power MOS FET

REJ03G0247-0200

Rev.2.00

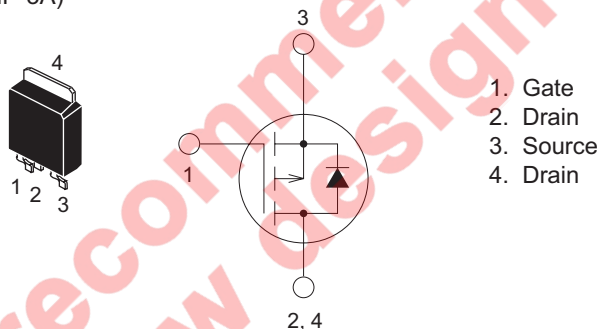
Nov 21, 2006

Features

- Drive voltage : 4 V
- $V_{DSS} : -30 \text{ V}$
- $r_{DS(ON) (max)} : 0.29 \Omega$
- $I_D : -6 \text{ A}$
- Recovery Time of the Integrated Fast Recovery Diode (TYP.) : 40 ns

Outline

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



Applications

Motor control, lamp control, solenoid control, DC-DC converters, etc.

Maximum Ratings

(Tc = 25°C)

Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	-30	V	$V_{GS} = 0 \text{ V}$
Gate-source voltage	V_{GSS}	± 20	V	$V_{DS} = 0 \text{ V}$
Drain current	I_D	-6	A	
Drain current (Pulsed)	I_{DM}	-24	A	
Avalanche current (Pulsed)	I_{DA}	-6	A	$L = 30 \mu\text{H}$
Source current	I_S	-6	A	
Source current (Pulsed)	I_{SM}	-24	A	
Maximum power dissipation	P_D	20	W	
Channel temperature	T_{ch}	-55 to +150	°C	
Storage temperature	T_{stg}	-55 to +150	°C	
Mass	—	0.32	g	Typical value

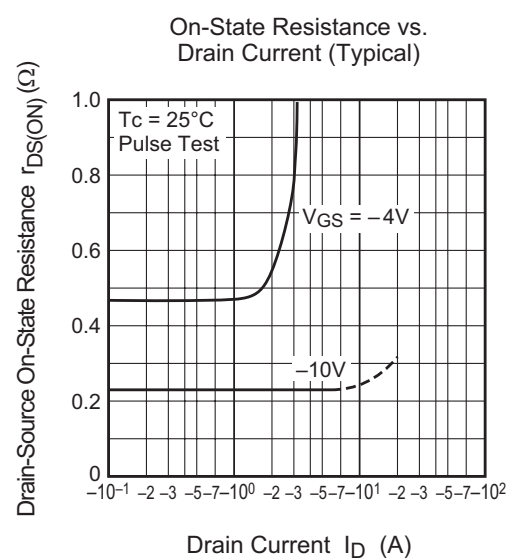
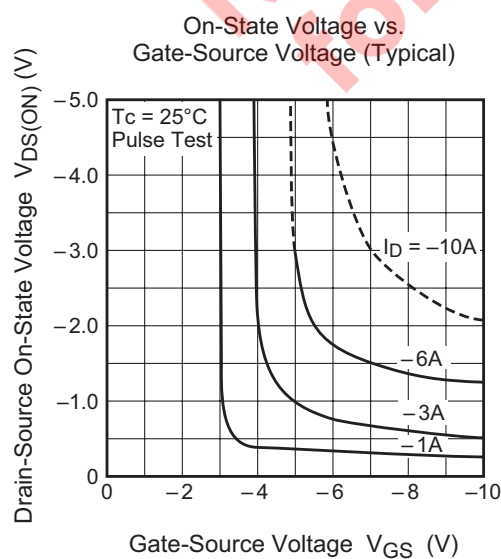
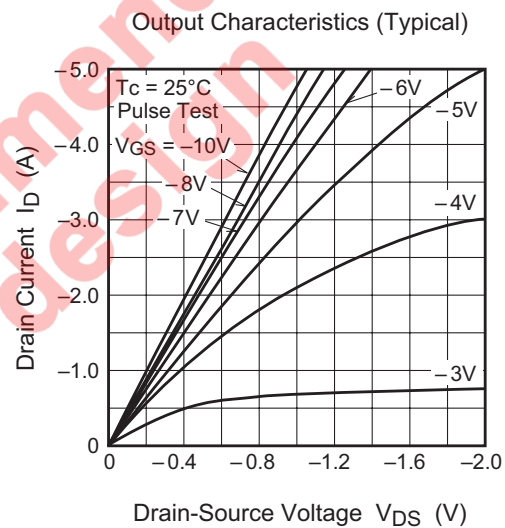
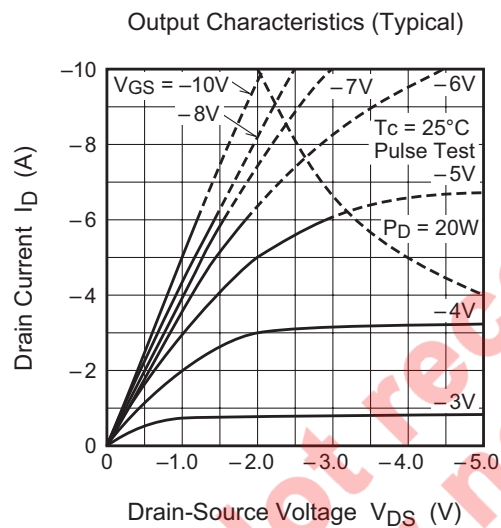
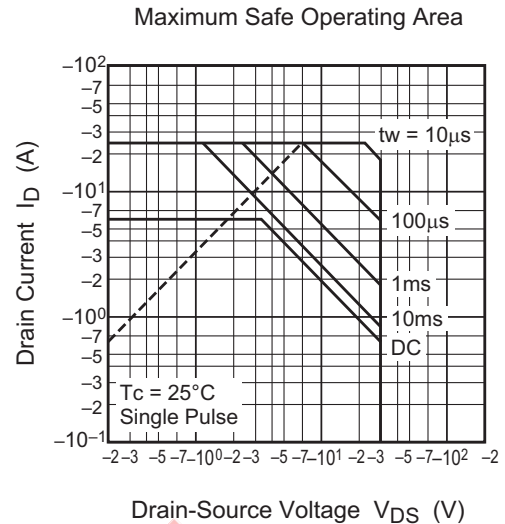
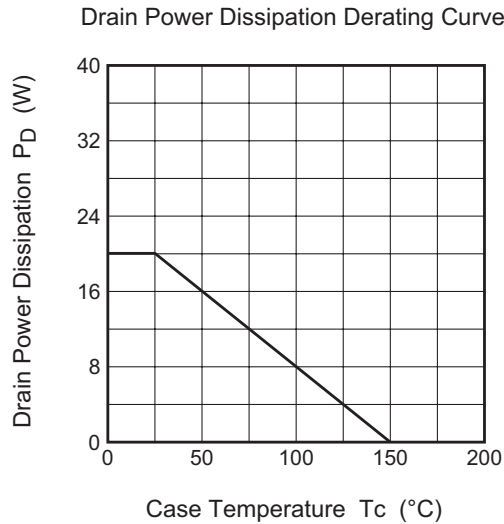
Electrical Characteristics

(Tch = 25°C)

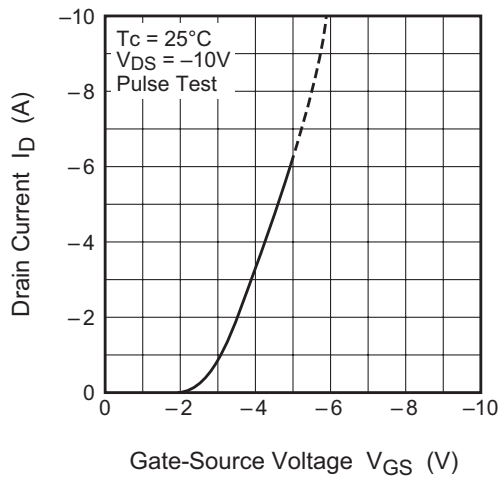
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	-30	—	—	V	$I_D = -1 \text{ mA}$, $V_{GS} = 0 \text{ V}$
Gate-source leakage current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0 \text{ V}$
Drain-source leakage current	I_{DSS}	—	—	-0.1	mA	$V_{DS} = -30 \text{ V}$, $V_{GS} = 0 \text{ V}$
Gate-source threshold voltage	$V_{GS(th)}$	-1.3	-1.8	-2.3	V	$I_D = -1 \text{ mA}$, $V_{DS} = -10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	0.23	0.29	Ω	$I_D = -3 \text{ A}$, $V_{GS} = -10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	0.46	0.62	Ω	$I_D = -1 \text{ A}$, $V_{GS} = -4 \text{ V}$
Drain-source on-state voltage	$V_{DS(ON)}$	—	-0.69	-0.87	V	$I_D = -3 \text{ A}$, $V_{GS} = -10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	—	2.6	—	S	$I_D = -3 \text{ A}$, $V_{DS} = -5 \text{ V}$
Input capacitance	C_{iss}	—	550	—	pF	$V_{DS} = -10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	165	—	pF	
Reverse transfer capacitance	C_{rss}	—	45	—	pF	
Turn-on delay time	$t_{d(on)}$	—	9	—	ns	$V_{DD} = -15 \text{ V}$, $I_D = -3 \text{ A}$, $V_{GS} = -10 \text{ V}$, $R_{GEN} = R_{GS} = 50 \Omega$
Rise time	t_r	—	14	—	ns	
Turn-off delay time	$t_{d(off)}$	—	32	—	ns	
Fall time	t_f	—	14	—	ns	
Source-drain voltage	V_{SD}	—	-1.0	-1.5	V	$I_S = -3 \text{ A}$, $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	6.25	$^{\circ}\text{C/W}$	Channel to case
Reverse recovery time	t_{rr}	—	40	—	ns	$I_S = -3 \text{ A}$, $dis/dt = 50 \text{ A}/\mu\text{s}$

Not recommended
for new designs

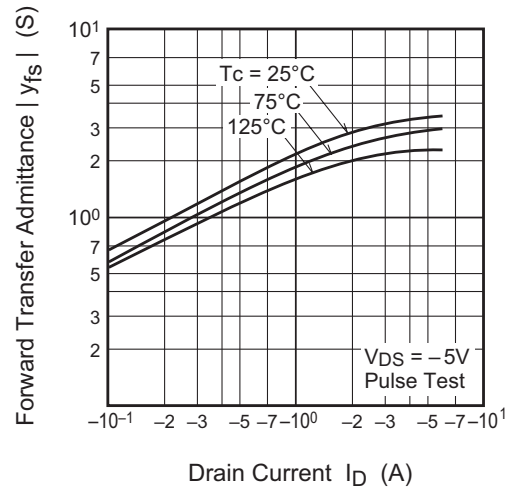
Performance Curves



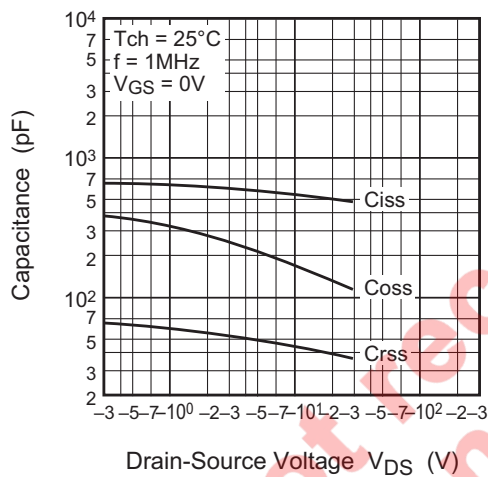
Transfer Characteristics (Typical)



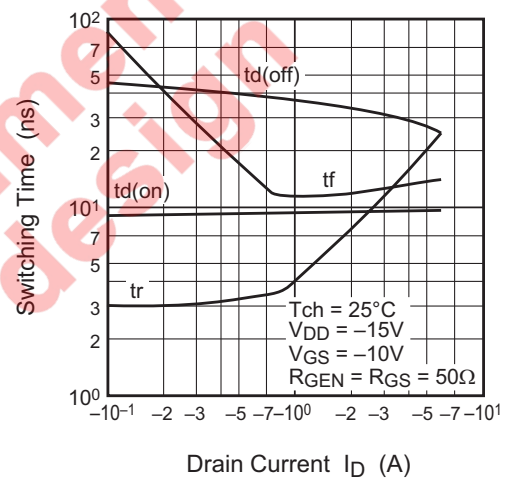
Forward Transfer Admittance vs. Drain Current (Typical)



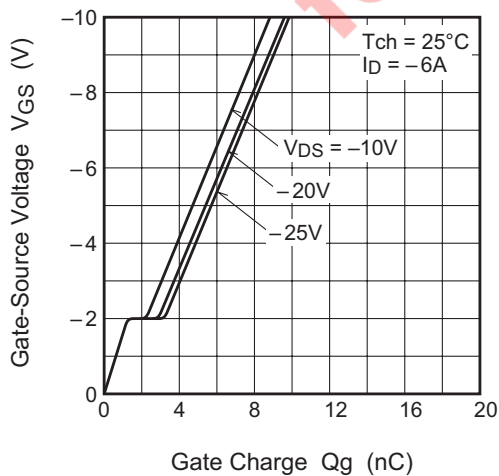
Capacitance vs. Drain-Source Voltage (Typical)



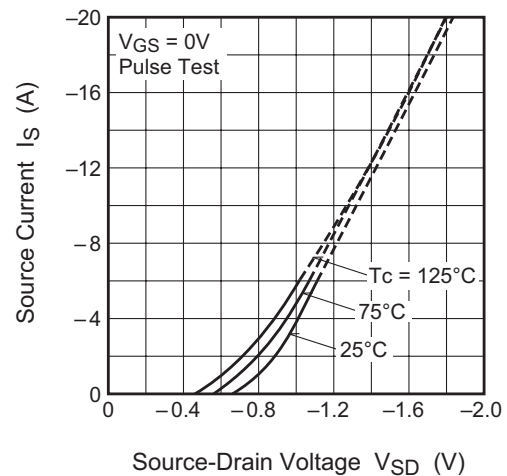
Switching Characteristics (Typical)

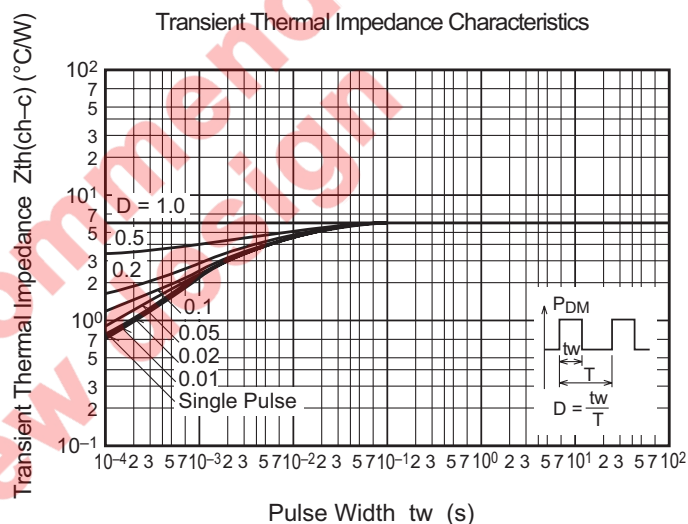
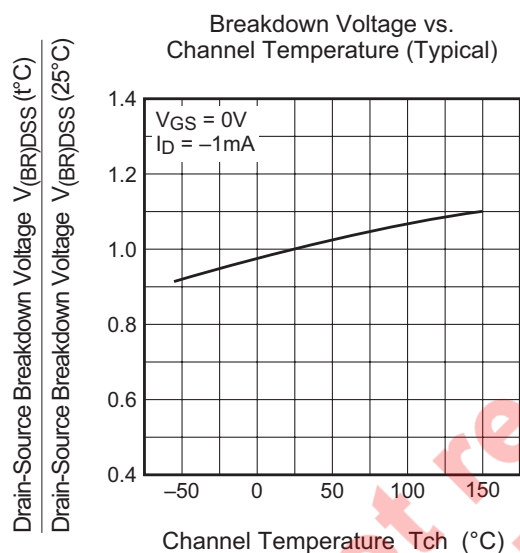
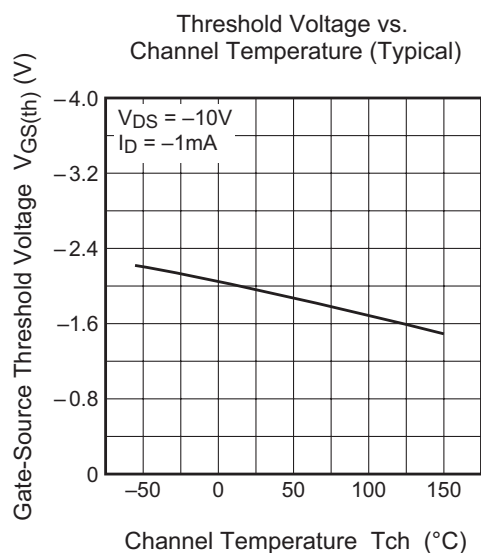
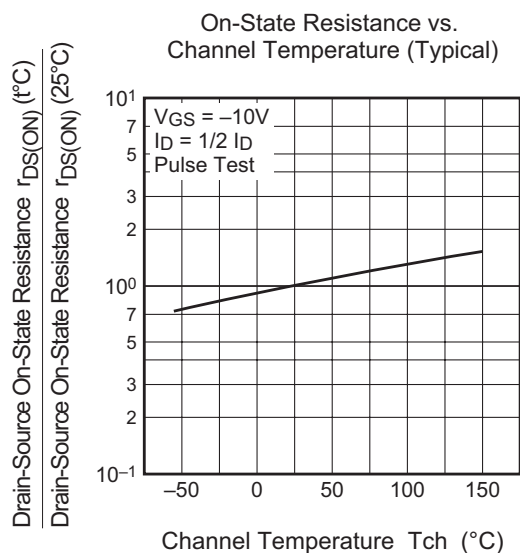


Gate-Source Voltage vs. Gate Charge (Typical)

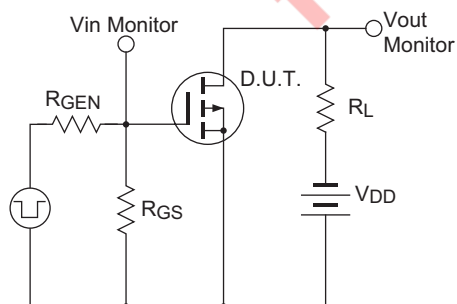


Source-Drain Diode Forward Characteristics (Typical)

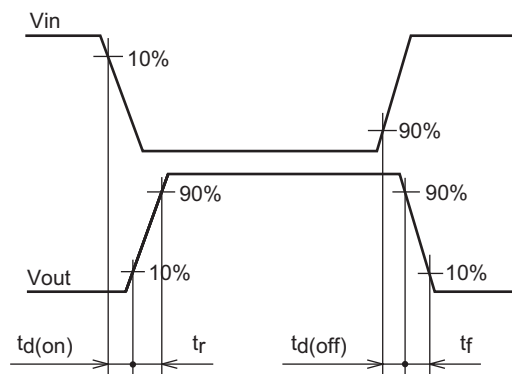




Switching Time Measurement Circuit



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 FX6ASJ-03 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 + 2.5 mm). The bottom view shows a width of 2.3 mm and a length of 0.76 mm. The package has a central lead with a width of 0.76 mm and a height of 1 mm. The lead is bent at a 90-degree angle, with a bend radius of 0.1 ± 0.1 mm. The lead has a length of 1.4 ± 0.2 mm and a width of 0.5 ± 0.2 mm. The package is shown in a perspective view with a red 'Not recommended for new design' watermark.

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	FX6ASJ-03-T13
Surface-mounted type	Plastic Magazine (Tube)	75	Type name	FX6ASJ-03

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

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