



FX20KMJ-06

High-Speed Switching Use
Pch Power MOS FET

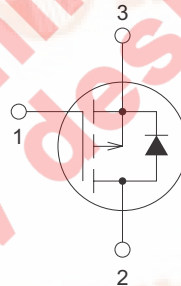
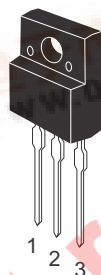
REJ03G1442-0200
(Previous: MEJ02G0275-0101)
Rev.2.00
Aug 07, 2006

Features

- Drive voltage : 4 V
- V_{DSS} : - 60 V
- $r_{DS(ON)(max)}$: 97 m Ω
- I_D : - 20 A
- Integrated Fast Recovery Diode (TYP.) : 50 ns
- Viso : 2000 V

Outline

RENESAS Package code: PRSS0003AB-A
(Package name: TO-220FN)



1. Gate
2. Drain
3. Source

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}	-60	V	$V_{GS} = 0$ V
Gate-source voltage	V_{GSS}	± 20	V	$V_{DS} = 0$ V
Drain current	I_D	-20	A	
Drain current (Pulsed)	I_{DM}	-80	A	
Avalanche drain current (Pulsed)	I_{DA}	-20	A	L = 100 μ H
Source current	I_S	-20	A	
Source current (Pulsed)	I_{SM}	-80	A	
Maximum power dissipation	P_D	25	W	
Channel temperature	Tch	- 55 to +150	°C	
Storage temperature	Tstg	- 55 to +150	°C	
Isolation voltage	Viso	2000	V	AC for 1 minute, Terminal to case
Mass	—	2.0	g	Typical value



Electrical Characteristics

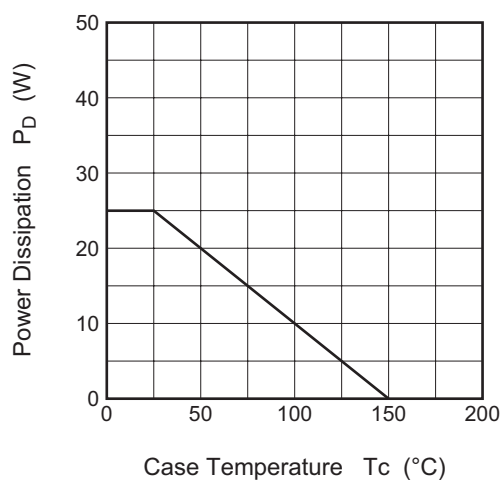
(Tch = 25°C)

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	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	$V_{DS} = -60 \text{ V}$, $V_{GS} = 0 \text{ V}$
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	$r_{DS(ON)}$	—	73	97	$\text{m}\Omega$	$I_D = -10 \text{ A}$, $V_{GS} = -10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	119	166	$\text{m}\Omega$	$I_D = -10 \text{ A}$, $V_{GS} = -4 \text{ V}$
Drain-source on-state voltage	$V_{DS(ON)}$	—	-0.73	-0.97	V	$I_D = -10 \text{ A}$, $V_{GS} = -10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	—	10.9	—	S	$I_D = -10 \text{ A}$, $V_{DS} = -10 \text{ V}$
Input capacitance	C_{iss}	—	2370	—	pF	$V_{DS} = -10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	306	—	pF	
Reverse transfer capacitance	C_{rss}	—	147	—	pF	
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$V_{DD} = -30 \text{ V}$, $I_D = -10 \text{ A}$, $V_{GS} = -10 \text{ V}$, $R_{GEN} = R_{GS} = 50 \Omega$
Rise time	t_r	—	37	—	ns	
Turn-off delay time	$t_{d(off)}$	—	131	—	ns	
Fall time	t_f	—	72	—	ns	
Source-drain voltage	V_{SD}	—	-1.0	-1.5	V	$I_S = -10 \text{ A}$, $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	5.00	$^{\circ}\text{C/W}$	Channel to case
Reverse recovery time	t_{rr}	—	50	—	ns	$I_S = -20 \text{ A}$, $d_i/d_t = 100 \text{ A}/\mu\text{s}$

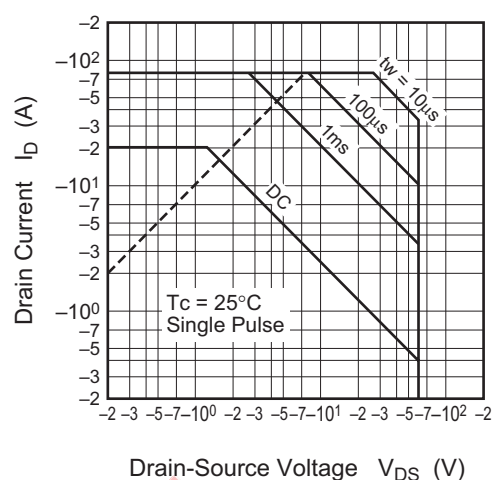
Not recommended
for new designs

Performance Curves

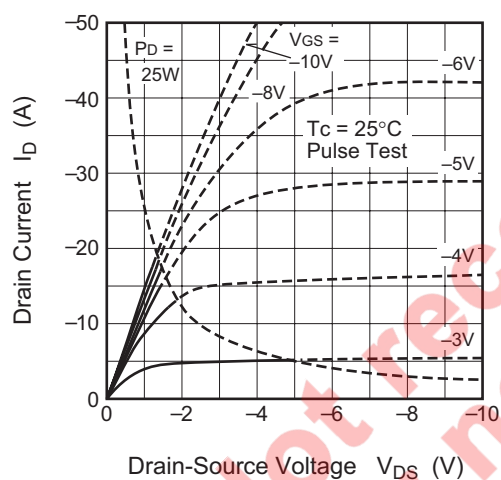
Power Dissipation Derating Curve



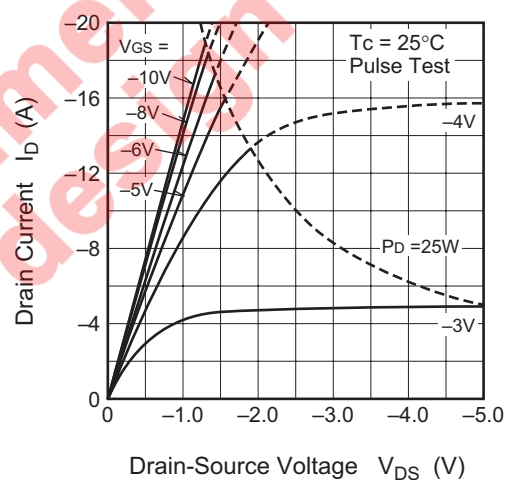
Maximum Safe Operating Area



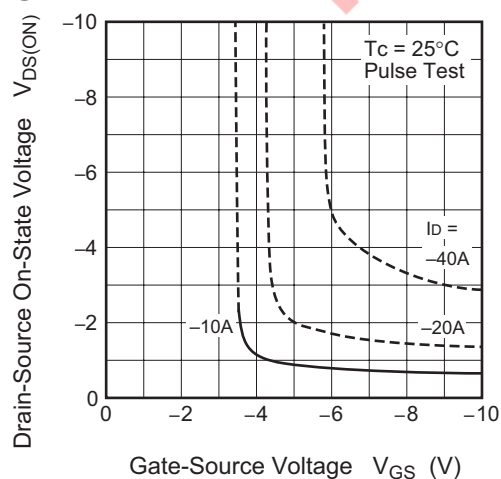
Output Characteristics (Typical)



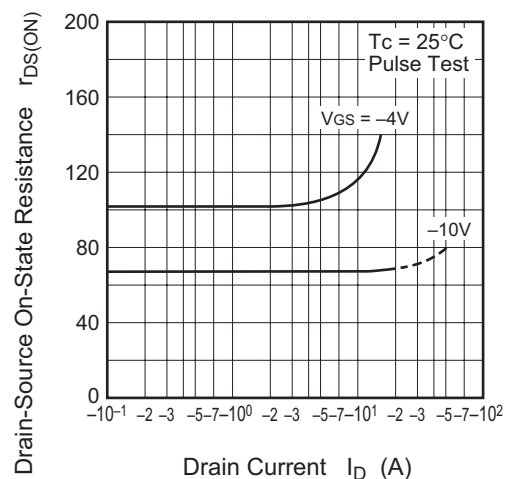
Output Characteristics (Typical)



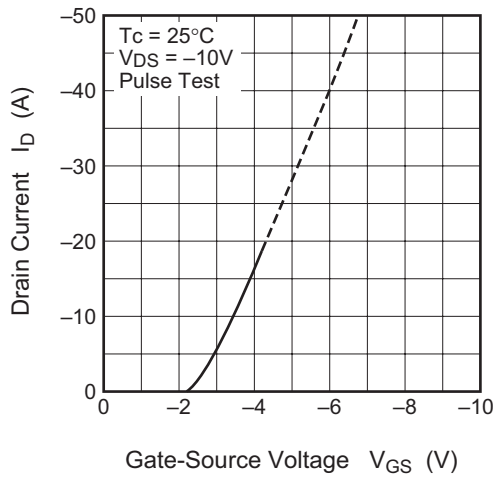
On-State Voltage vs. Gate-Source Voltage (Typical)



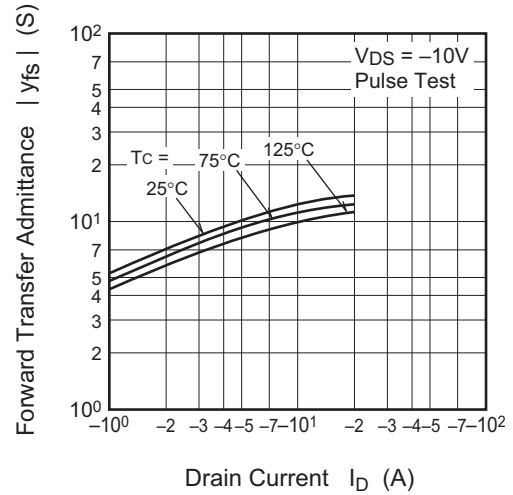
On-State Resistance vs. Drain Current (Typical)



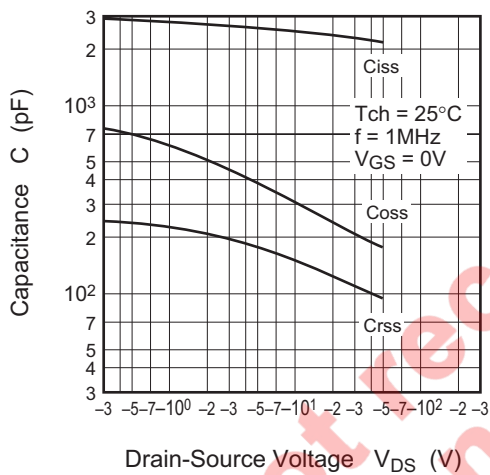
Transfer Characteristics (Typical)



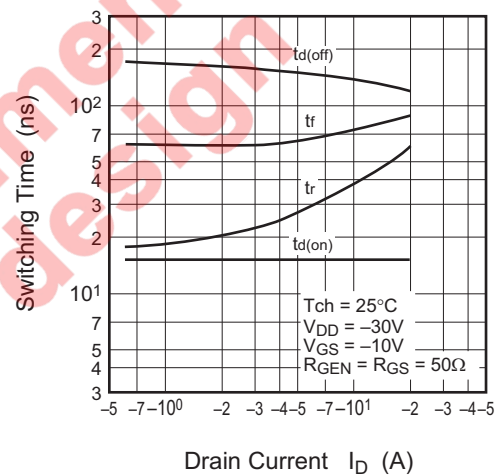
Forward Transfer Admittance vs. Drain Current (Typical)



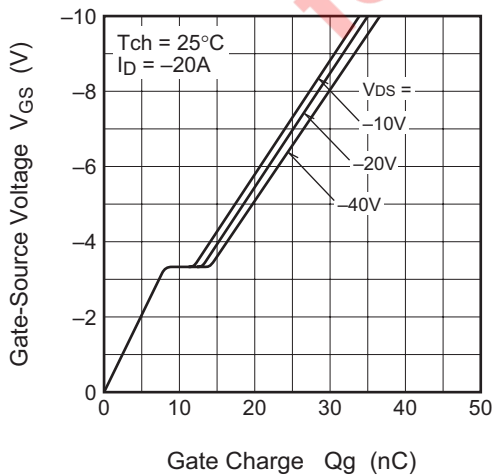
Capacitance vs. Drain-Source Voltage (Typical)



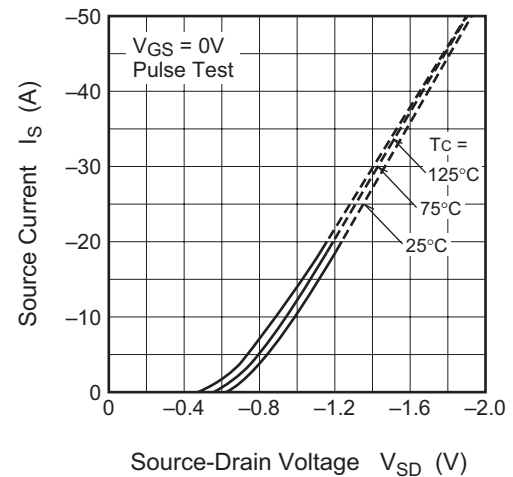
Switching Characteristics (Typical)

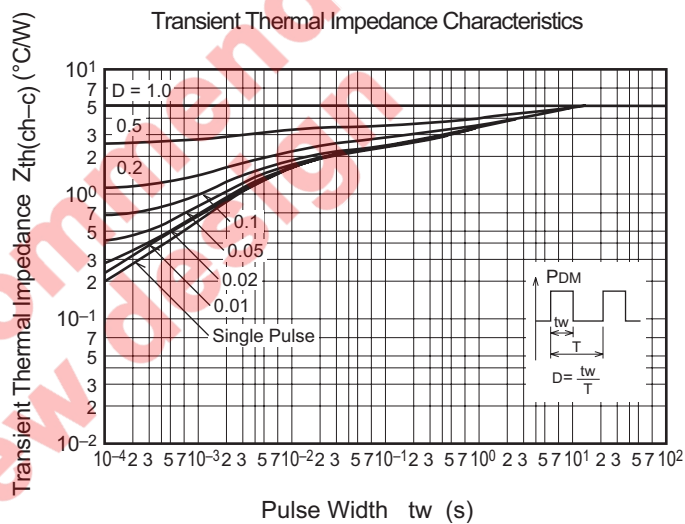
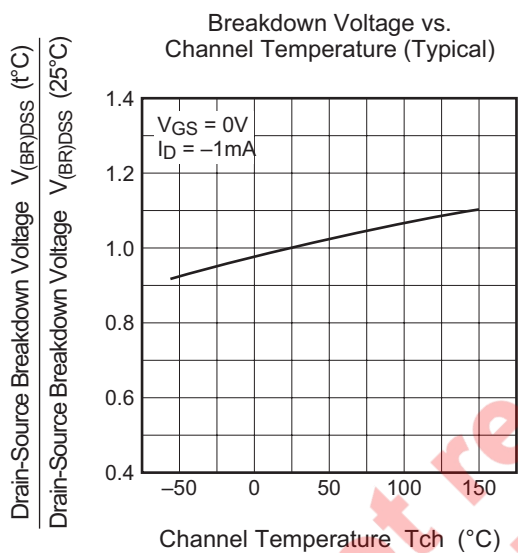
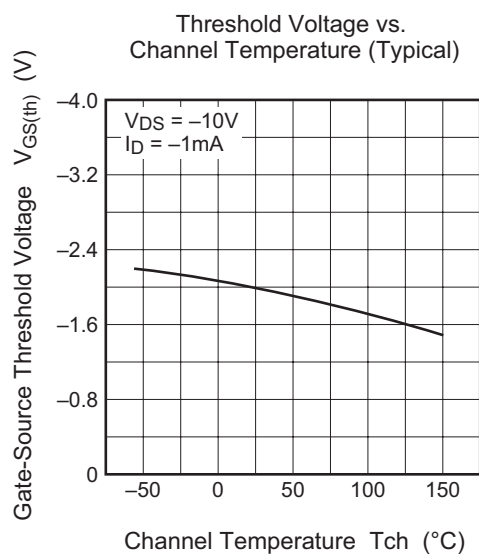
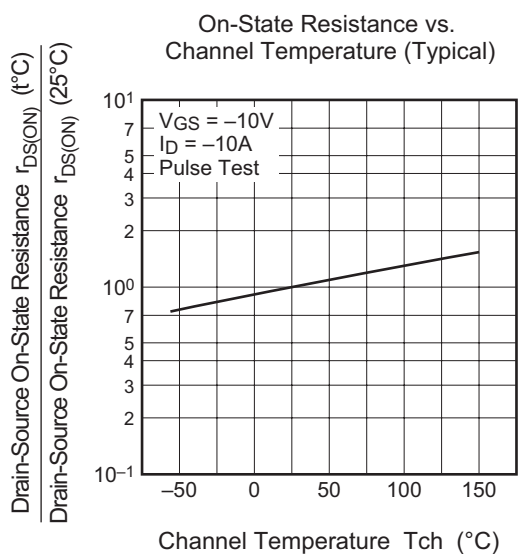


Gate-Source Voltage vs. Gate Charge (Typical)

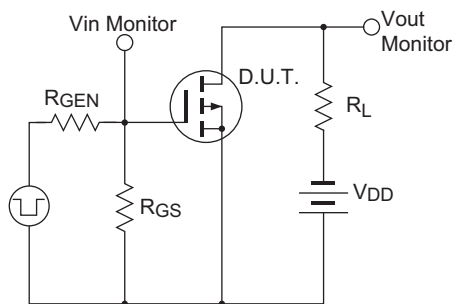


Source-Drain Diode Forward Characteristics (Typical)

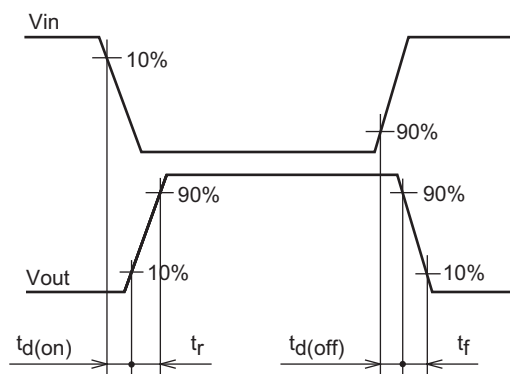


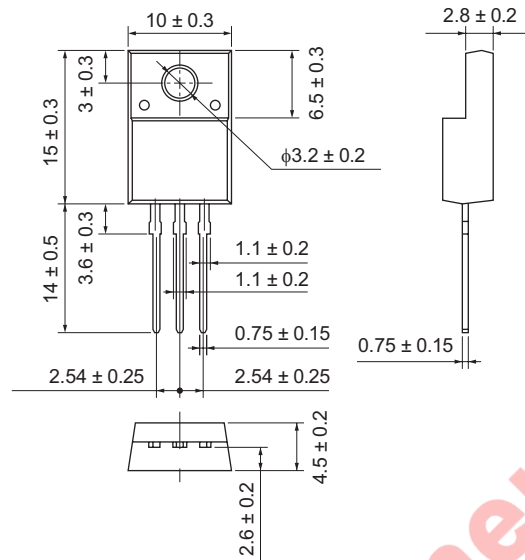


Switching Time Measurement Circuit



Switching Waveform



Unit: mm

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Plastic Magazine (Tube)	50	Type name	FX20KMJ-06
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FX20KMJ-06-A8

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.

Unit 204, 205, AZIACenter, No.1233 Lujiazui Ring Rd, Pudong District, Shanghai, China 200120
Tel: <86> (21) 5877-1818, Fax: <86> (21) 6887-7898

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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