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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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FS100UMJ-03F

High-Speed Switching Use
Nch Power MOS FET

REJ03G0249-0100

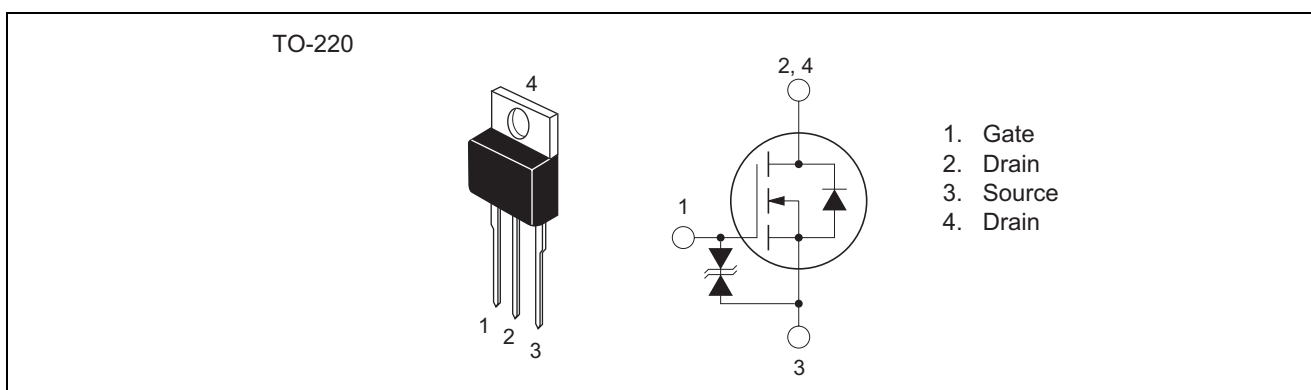
Rev.1.00

Aug.20.2004

Features

- Drive voltage : 4 V
- V_{DSS} : 30 V
- $r_{DS(ON)(max)}$: 4.0 m Ω
- I_D : 100 A
- Recovery Time of the Integrated Fast Recovery Diode (TYP.) : 80 ns

Outline



Applications

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

Maximum Ratings

($T_c = 25^\circ\text{C}$)

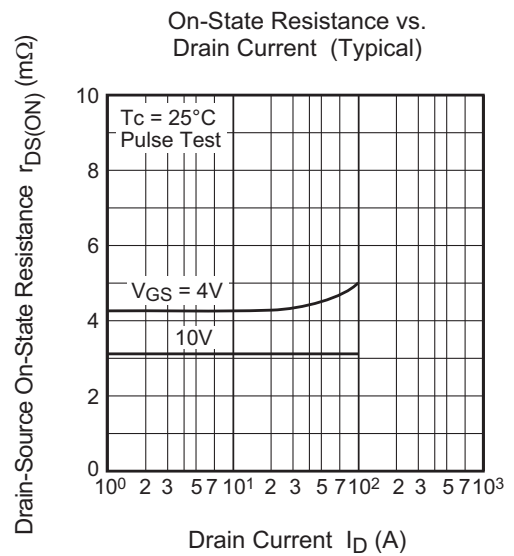
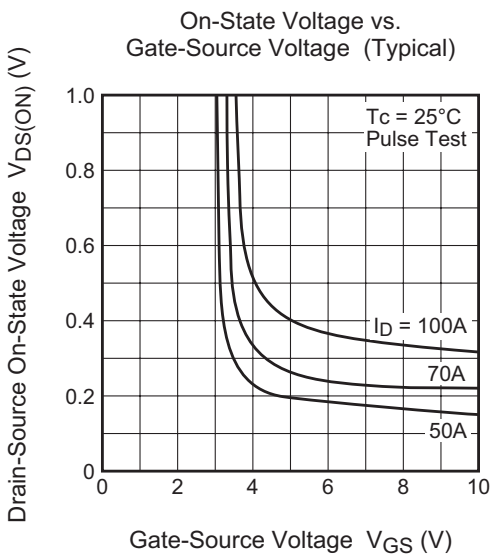
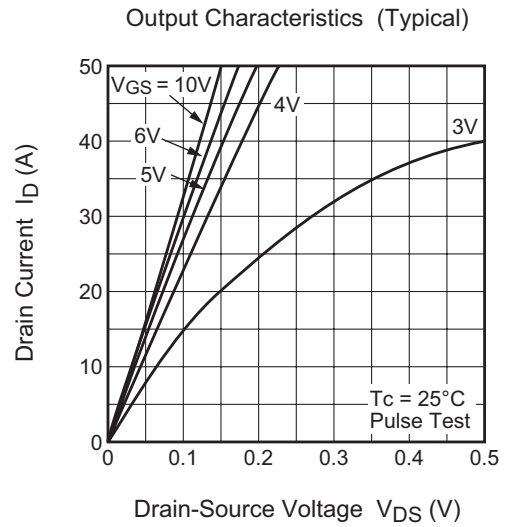
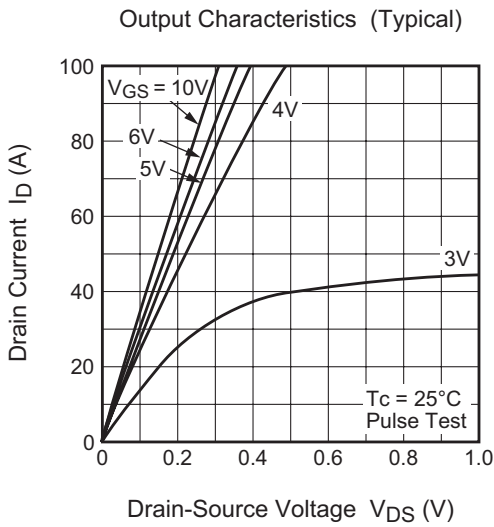
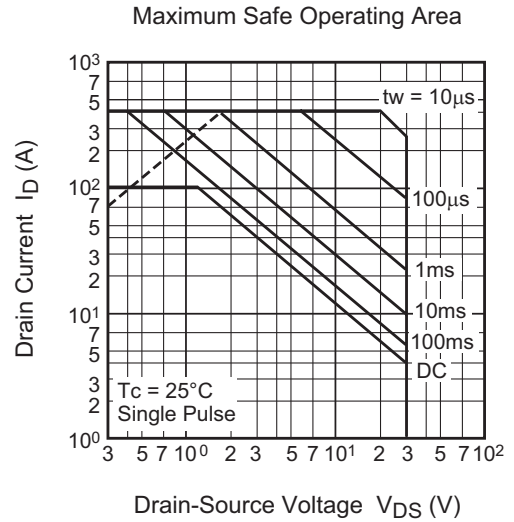
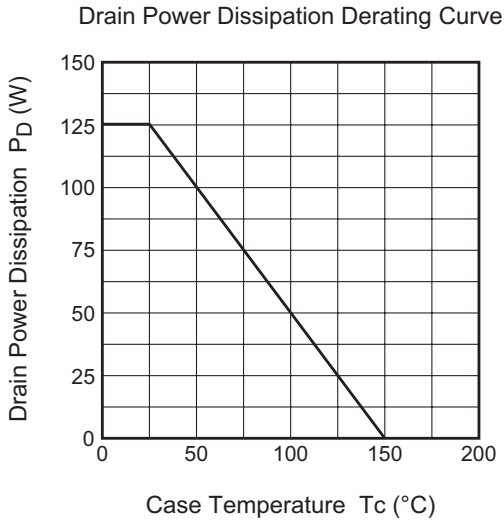
Parameter	Symbol	Ratings	Unit	Conditions
Drain-source voltage	V_{DSS}	30	V	$V_{GS} = 0\text{ V}$
Gate-source voltage	V_{GSS}	± 20	V	$V_{DS} = 0\text{ V}$
Drain current	I_D	100	A	
Drain current (Pulsed)	I_{DM}	400	A	
Avalanche current (Pulsed)	I_{DA}	100	A	$L = 10\ \mu\text{H}$
Source current	I_S	100	A	
Source current (Pulsed)	I_{SM}	400	A	
Maximum power dissipation	P_D	125	W	
Channel temperature	T_{ch}	- 55 to +150	$^\circ\text{C}$	
Storage temperature	T_{stg}	- 55 to +150	$^\circ\text{C}$	
Mass	—	2.0	g	Typical value

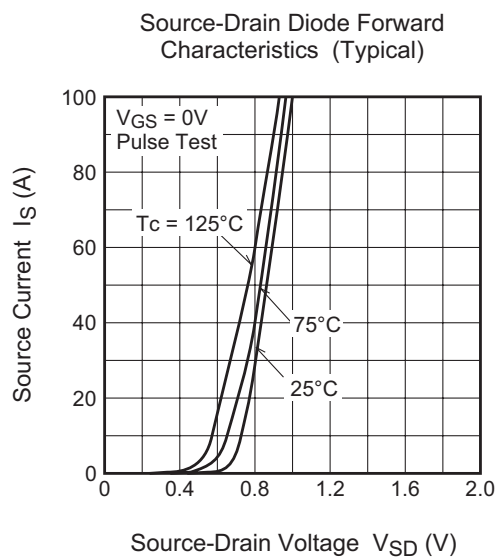
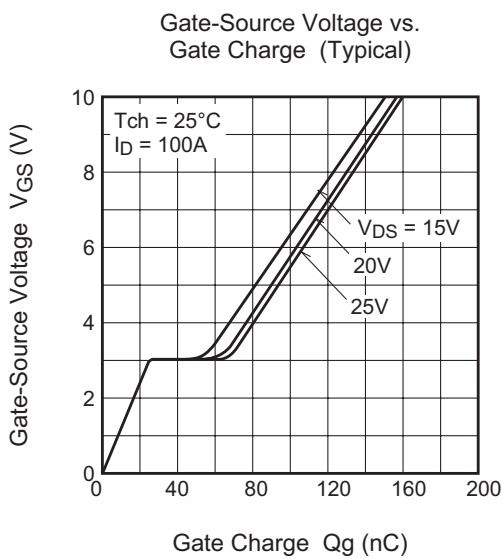
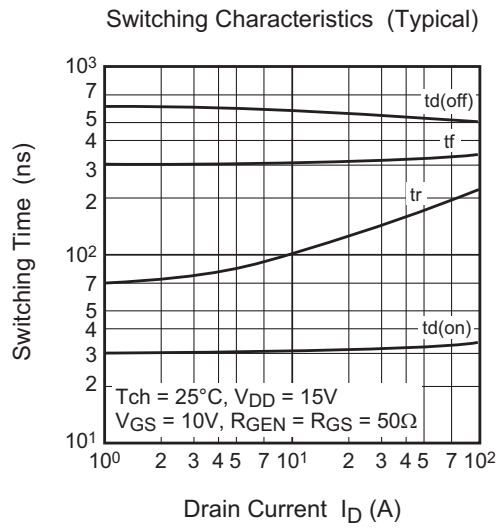
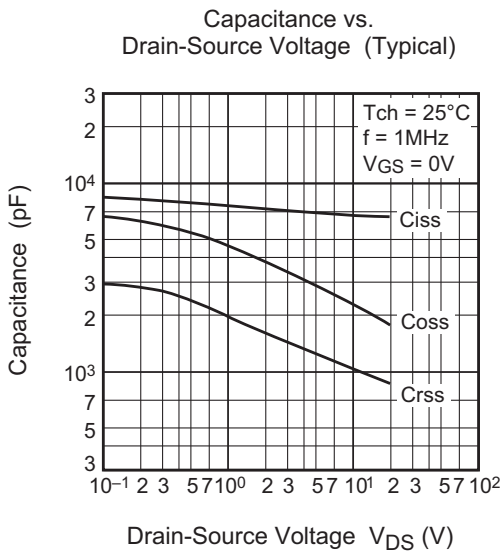
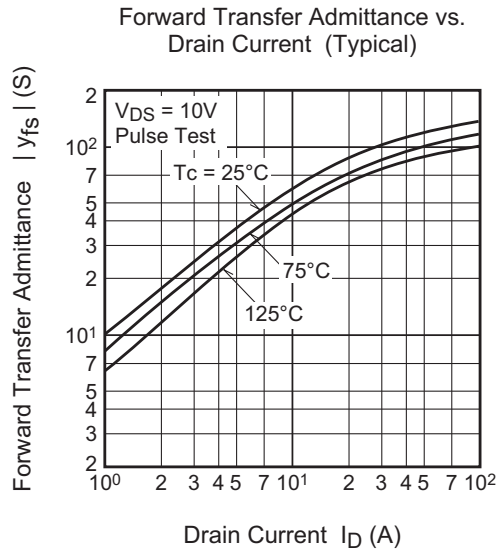
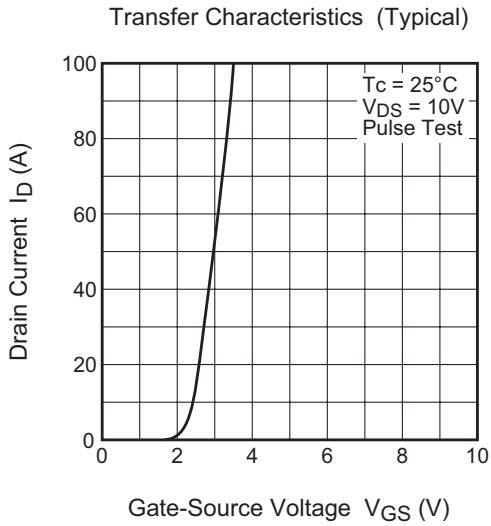
Electrical Characteristics

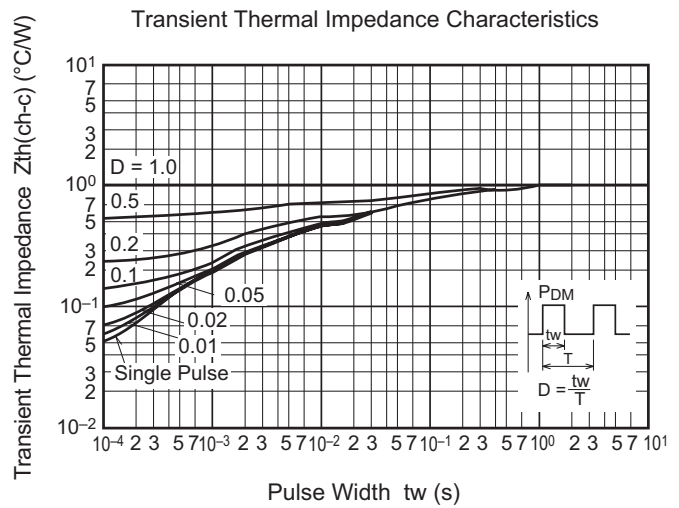
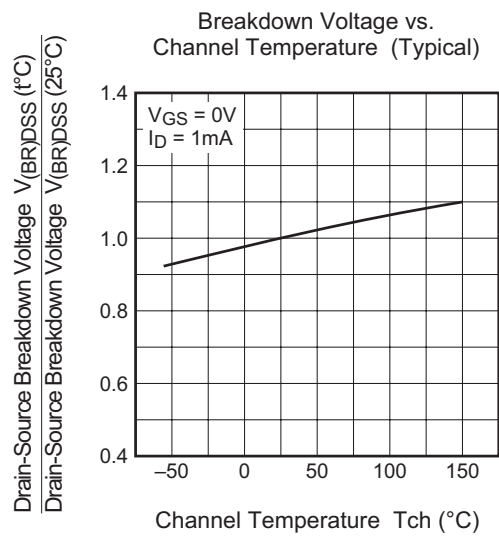
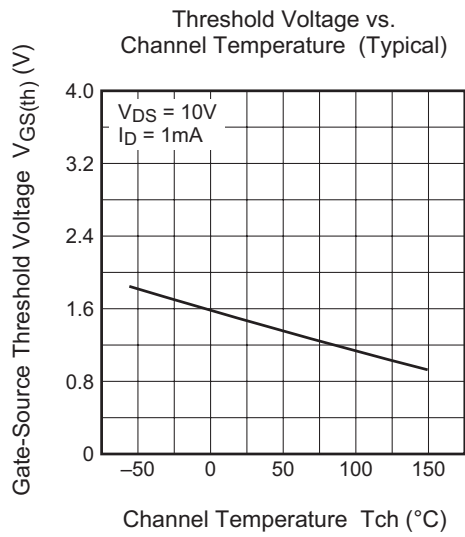
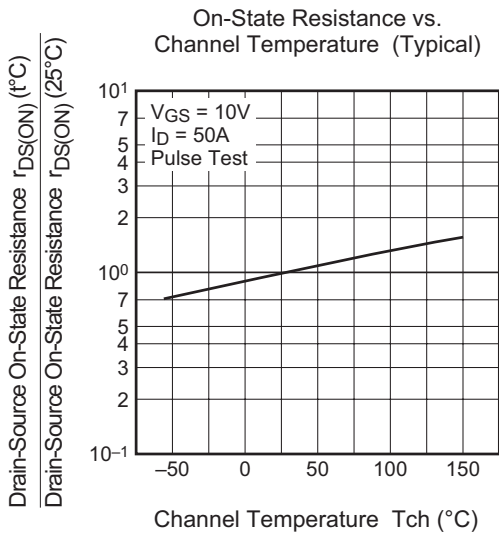
(T_{ch} = 25°C)

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 breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0 \text{ V}$
Drain-source leakage current	I_{DSS}	—	—	100	μA	$V_{DS} = 30 \text{ V}$, $V_{GS} = 0 \text{ V}$
Gate-source leakage current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0 \text{ V}$
Gate-source threshold voltage	$V_{GS(th)}$	1.0	1.5	2.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	3.1	4.0	m Ω	$I_D = 50 \text{ A}$, $V_{GS} = 10 \text{ V}$
Drain-source on-state resistance	$r_{DS(ON)}$	—	4.2	5.7	m Ω	$I_D = 50 \text{ A}$, $V_{GS} = 4 \text{ V}$
Drain-source on-state voltage	$V_{DS(ON)}$	—	0.16	0.20	V	$I_D = 50 \text{ A}$, $V_{GS} = 10 \text{ V}$
Forward transfer admittance	$ y_{fs} $	—	120	—	S	$I_D = 50 \text{ A}$, $V_{DS} = 10 \text{ V}$
Input capacitance	C_{iss}	—	7600	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	2300	—	pF	
Reverse transfer capacitance	C_{rss}	—	1000	—	pF	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$V_{DD} = 15 \text{ V}$, $I_D = 50 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_{GEN} = R_{GS} = 50 \text{ }\Omega$
Rise time	t_r	—	170	—	ns	
Turn-off delay time	$t_{d(off)}$	—	520	—	ns	
Fall time	t_f	—	290	—	ns	
Source-drain voltage	V_{SD}	—	1.0	1.5	V	$I_S = 50 \text{ A}$, $V_{GS} = 0 \text{ V}$
Thermal resistance	$R_{th(ch-c)}$	—	—	1.0	$^{\circ}\text{C/W}$	Channel to case
Reverse recovery time	t_{rr}	—	80	—	ns	$I_S = 50 \text{ A}$, $di/dt = -50 \text{ A}/\mu\text{s}$

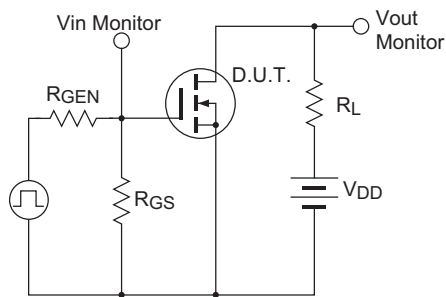
Performance Curves



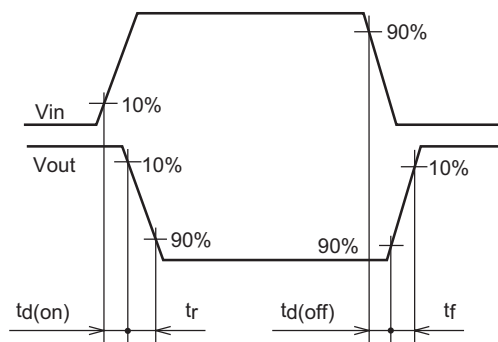




Switching Time Measurement Circuit



Switching Waveform



Package Dimensions

TO-220

EIAJ Package Code	JEDEC Code	Mass (g) (reference value)	Lead Material
Conforms	Conforms	2.0	Cu alloy

Symbol	Dimension in Millimeters		
	Min	Typ	Max
A	—	—	—
A ₁	—	—	—
A ₂	—	—	—
b	—	—	—
D	—	—	—
E	—	—	—
e	—	—	—
x	—	—	—
y	—	—	—
y ₁	—	—	—
ZD	—	—	—
ZE	—	—	—

Note 1) The dimensional figures indicate representative values unless otherwise the tolerance is specified.

Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Static electricity prevention bag	100	Type name	FS100UMJ-03F
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FS100UMJ-03F-A8

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

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Renesas Technology America, Inc.

450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500 Fax: <1> (408) 382-7501

Renesas Technology Europe Limited.

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, United Kingdom
Tel: <44> (1628) 585 100, Fax: <44> (1628) 585 900

Renesas Technology Europe GmbH

Dornacher Str. 3, D-85622 Feldkirchen, Germany
Tel: <49> (89) 380 70 0, Fax: <49> (89) 929 30 11

Renesas Technology Hong Kong Ltd.

7/F., North Tower, World Finance Centre, Harbour City, Canton Road, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2375-6836

Renesas Technology Taiwan Co., Ltd.

FL 10, #99, Fu-Hsing N. Rd., Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.

26/F., Ruijin Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.

1, Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001