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Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Not recommend for new design

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Not recommend for new design

FS50KM-3

High-Speed Switching Use
Nch Power MOS FET

REJ03G1419-0200
(Previous: MEJ02G0117-0101)
Rev.2.00
Aug 07, 2006

Features

- Drive voltage : 10 V
- V_{DSS} : 150 V
- $r_{DS(ON)\ (max)}$: 31 mΩ
- I_D : 50 A
- Integrated Fast Recovery Diode (TYP.) : 130 ns
- Viso : 2000 V

Outline

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

1. Gate
2. Drain
3. Source

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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}	150	V	V_{GS} = 0 V
Gate-source voltage	V_{GSS}	±20	V	V_{DS} = 0 V
Drain current	I_D	50	A	
Drain current (Pulsed)	I_{DM}	200	A	
Avalanche drain current (Pulsed)	I_{DA}	50	A	L = 100 µH
Source current	I_S	50	A	
Source current (Pulsed)	I_{SM}	200	A	
Maximum power dissipation	P_D	35	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	$V_{(BR)DSS}$	150	—	—	V	I_D = 1 mA, V_{GS} = 0 V
Gate-source leakage current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±20 V, V_{DS} = 0 V
Drain-source leakage current	I_{DSS}	—	—	0.1	mA	V_{DS} = 150 V, V_{GS} = 0 V
Gate-source threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	I_D = 1 mA, V_{DS} = 10 V
Drain-source on-state resistance	$r_{DS(ON)}$	—	24	31	mΩ	I_D = 25 A, V_{GS} = 10 V
Drain-source on-state voltage	$V_{DS(ON)}$	—	0.600	0.775	V	I_D = 25 A, V_{GS} = 10 V
Forward transfer admittance	$\lvert y_{fs} \rvert$	—	55	—	S	I_D = 25 A, V_{DS} = 10 V
Input capacitance	Ciss	—	6540	—	pF	V_{DS} = 10 V, V_{GS} = 0 V, f = 1MHz
Output capacitance	Coss	—	860	—	pF	
Reverse transfer capacitance	Crss	—	360	—	pF	
Turn-on delay time	$t_{d(on)}$	—	95	—	ns	V_{DD} = 80 V, I_D = 25 A, V_{GS} = 10 V, R_{GEN} = R_{GS} = 50 Ω
Rise time	t_r	—	155	—	ns	
Turn-off delay time	$t_{d(off)}$	—	380	—	ns	
Fall time	t_f	—	180	—	ns	
Source-drain voltage	V_{SD}	—	1.0	1.5	V	I_S = 25 A, V_{GS} = 0 V
Thermal resistance	$R_{th(ch-c)}$	—	—	3.57	°C/W	Channel to case
Reverse recovery time	t_{rr}	—	130	—	ns	I_S = 50 A, d_{is}/d_t = – 100 A/µs

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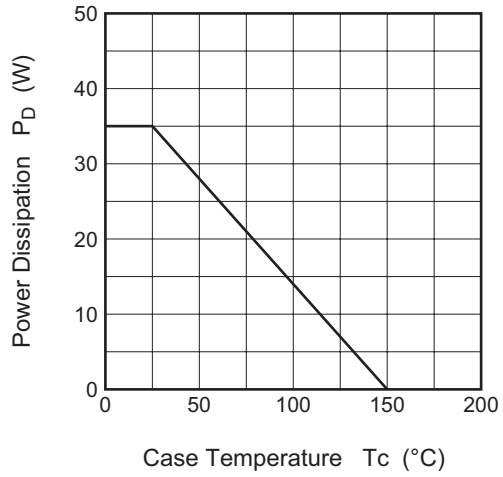
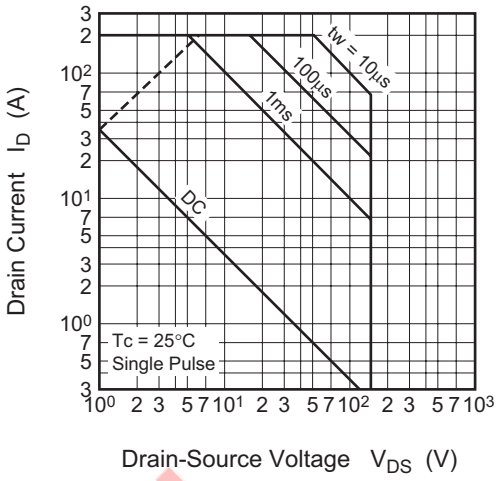
Performance Curves

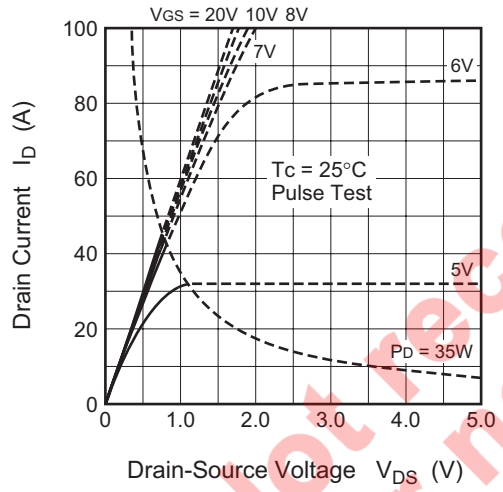
Power Dissipation Derating Curve



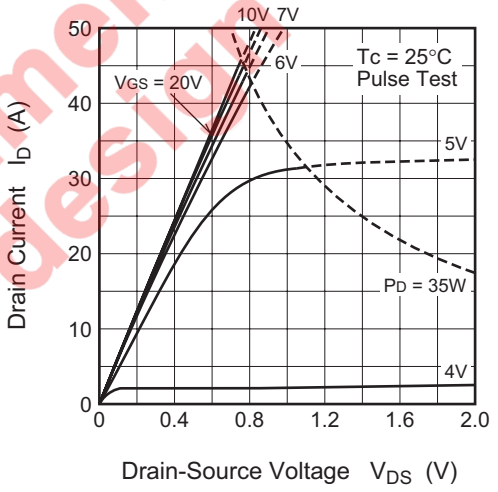
Maximum Safe Operating Area



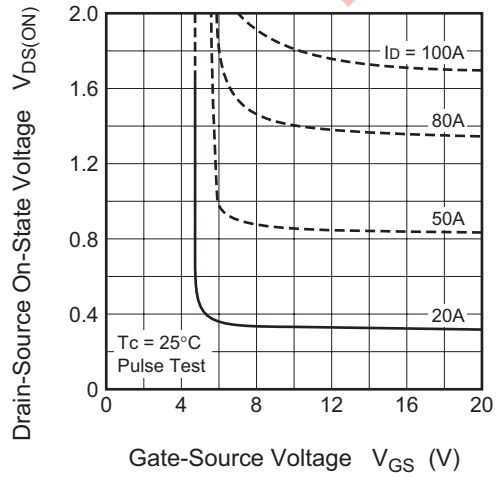
Output Characteristics (Typical)



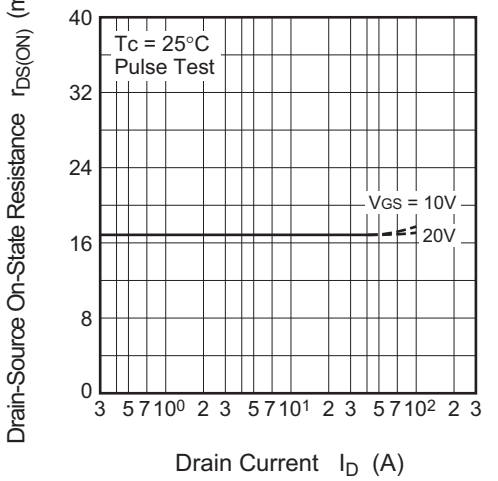
Output Characteristics (Typical)



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



On-State Resistance vs.
Drain Current (Typical)



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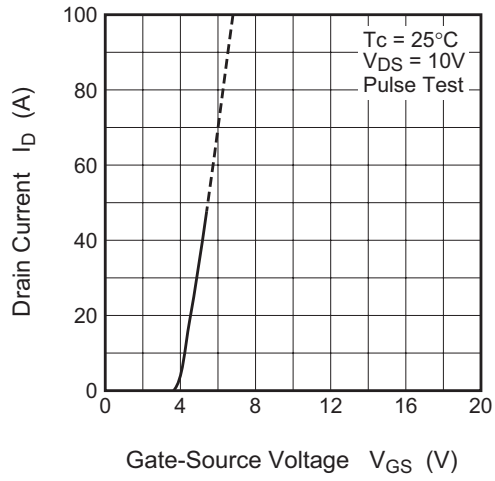
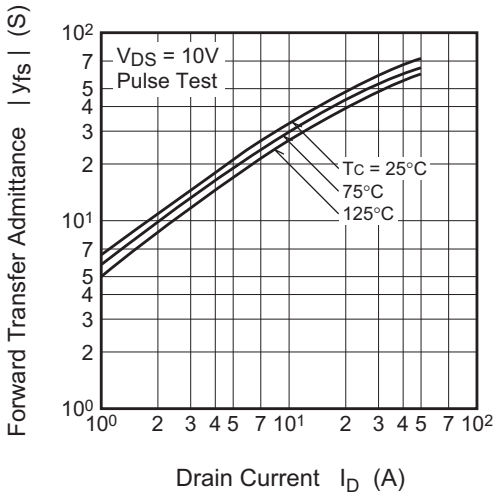
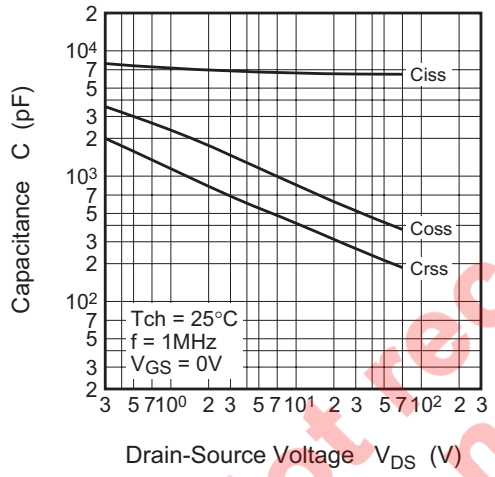
Transfer Characteristics (Typical)



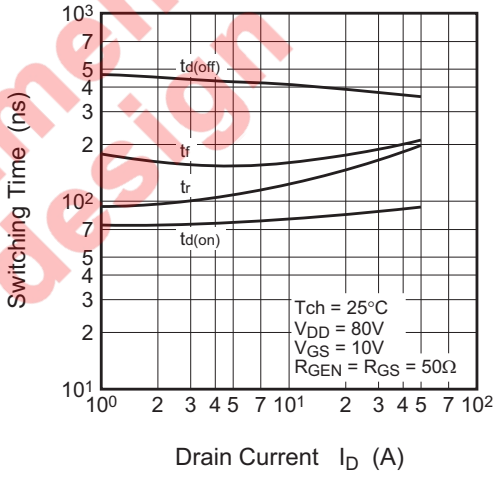
Forward Transfer Admittance vs. Drain Current (Typical)



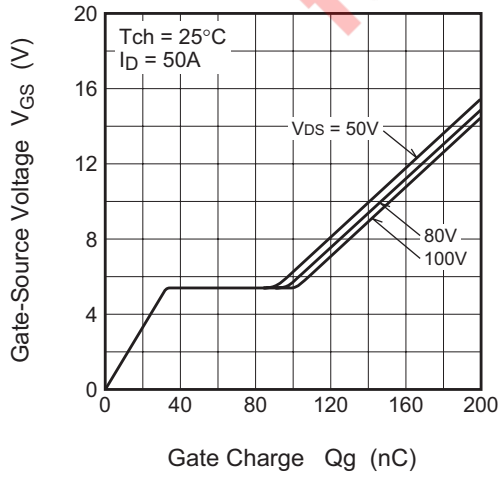
Capacitance vs. Drain-Source Voltage (Typical)



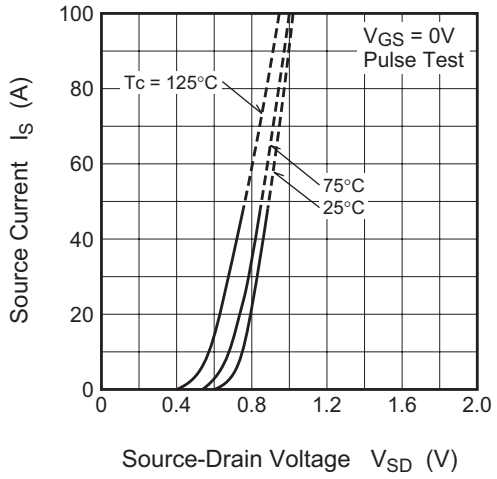
Switching Characteristics (Typical)



Gate-Source Voltage vs. Gate Charge (Typical)



Source-Drain Diode Forward Characteristics (Typical)



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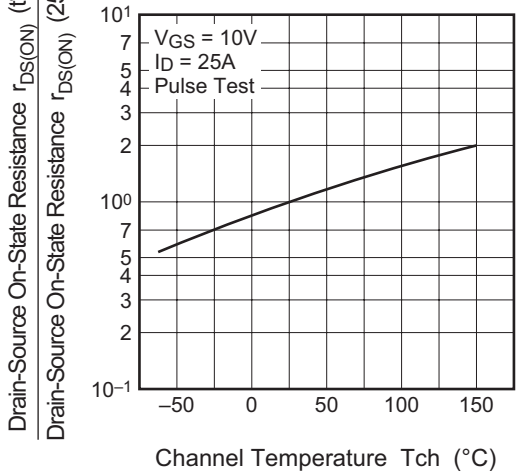
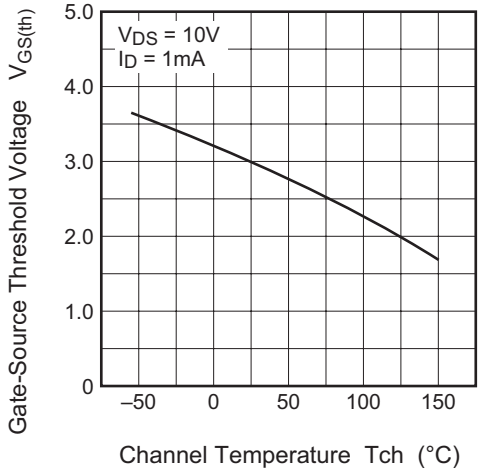
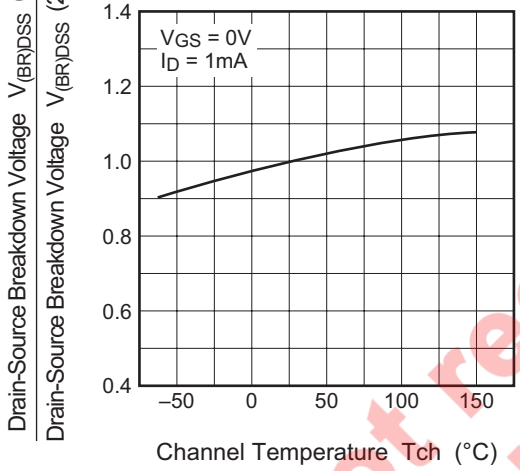
On-State Resistance vs.
Channel Temperature (Typical)



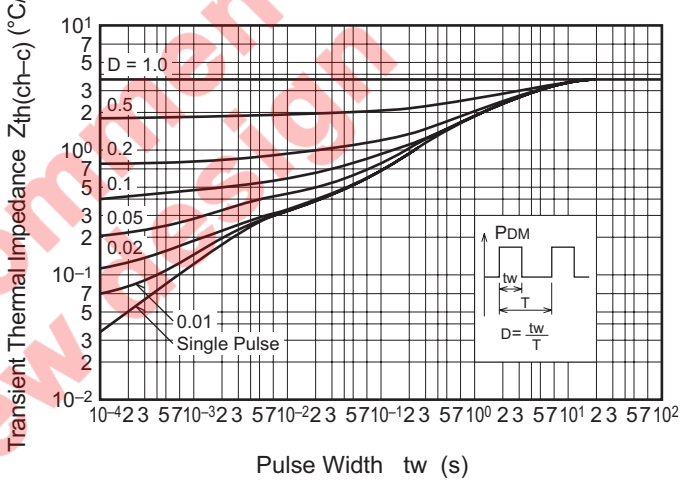
Threshold Voltage vs.
Channel Temperature (Typical)



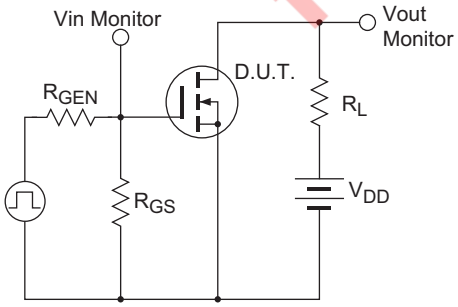
Breakdown Voltage vs.
Channel Temperature (Typical)



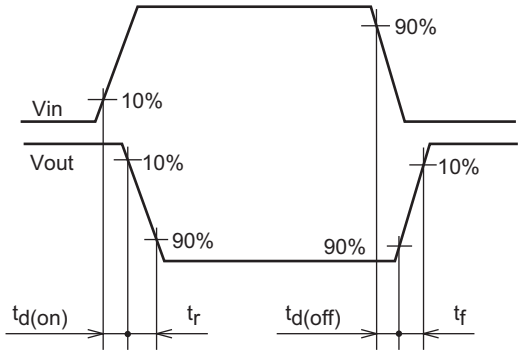
Transient Thermal Impedance Characteristics



Switching Time Measurement Circuit



Switching Waveform



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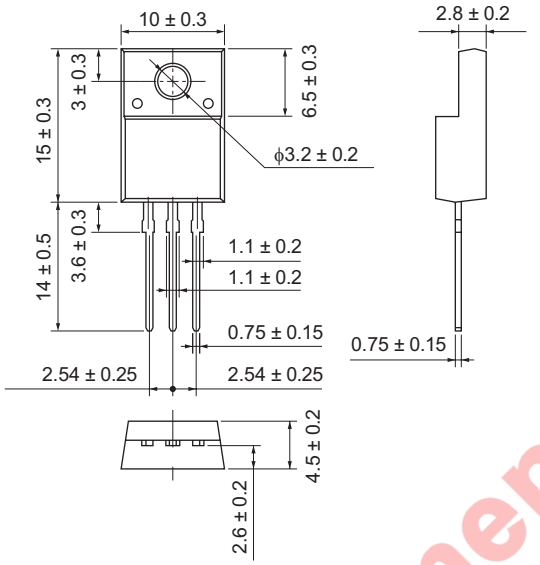
Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220FN	—	PRSS0003AB-A	—	2.0g

Unit: mm



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Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Plastic Magazine (Tube)	50	Type name	FS50KM-3
Lead form	Plastic Magazine (Tube)	50	Type name – Lead forming code	FS50KM-3-A8

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